Atlas of
Common Neonatal Presentations

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General

Appropriate for Gestational Age

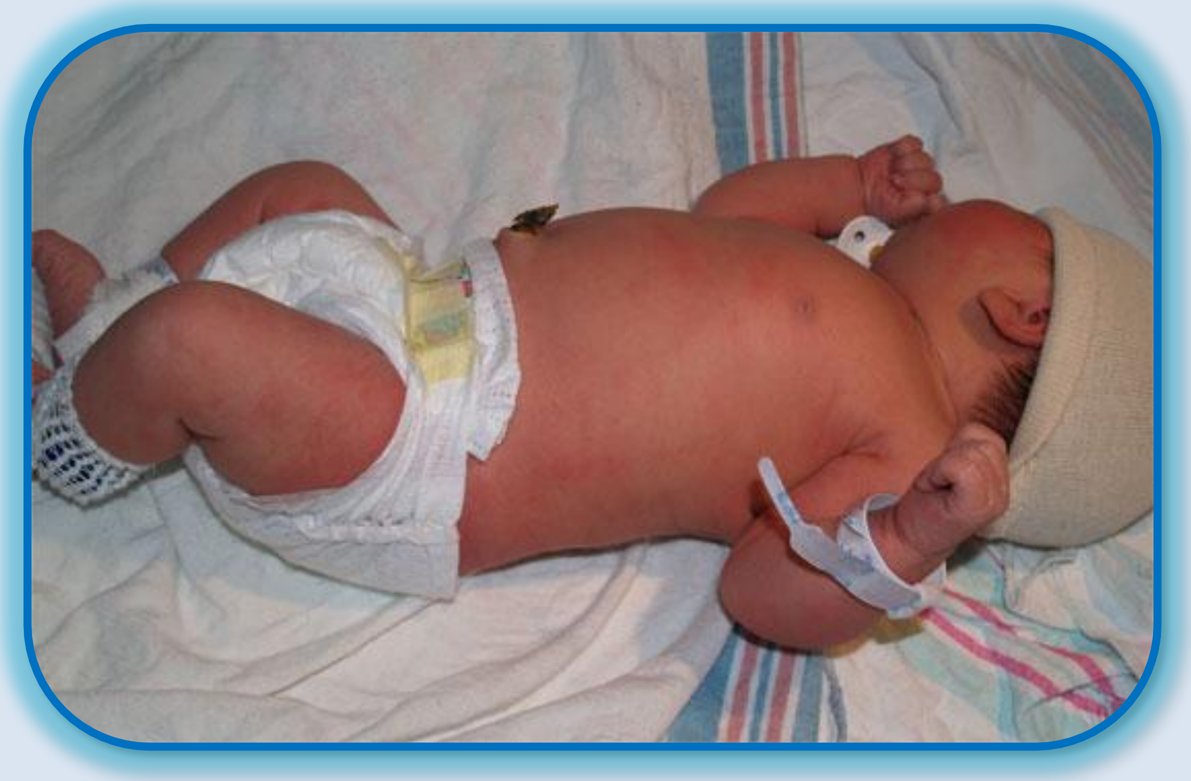
One of the earliest observations an examiner can make when evaluating a newborn is that of size.

Because small term babies and large preterm babies may be the same weight but have very different problems, **the categorization of size should always be made in relationship to the gestational age.**

Babies who are large or small for their age need special consideration.

Typically, term babies are appropriate for gestational age **(AGA)** when their weights fall between 5lb 12oz (2.5kg) and 8lb 12 oz (4kg). This baby, at about 7 pounds is AGA.

Large for Gestational Age

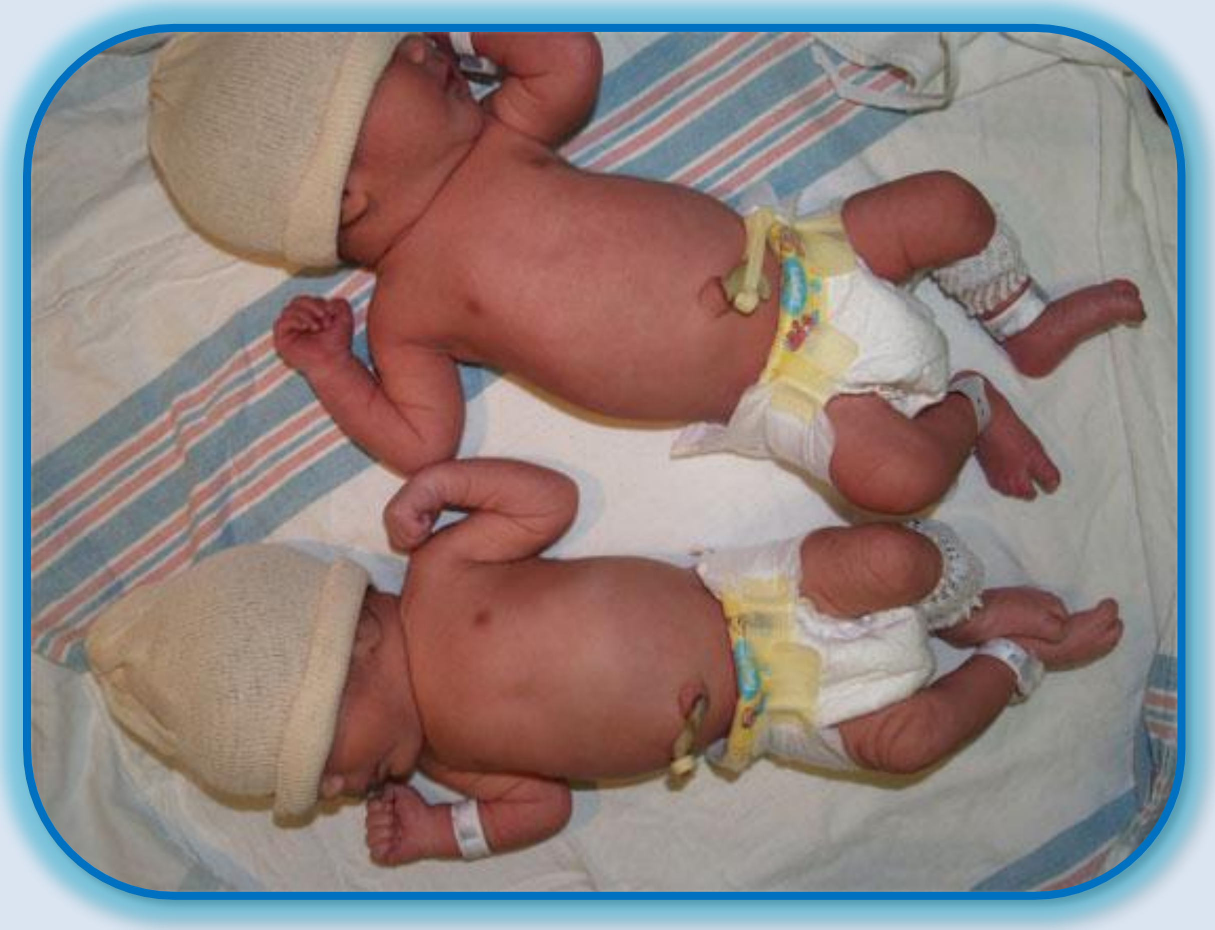


This infant is large for gestational age **(LGA)** with a birth weight of about 9 1/2 pounds.

These infants have much more glycogen at birth, but **hypoglycemia** may still be a problem as many of these babies are infants of diabetic mothers. When the ample glucose supply is interrupted with the cutting of the umbilical cord, the babies' pancreas may take a while to down-regulate, leaving the infant with high insulin and low glucose levels in the meantime.

Polycythemia may also be present. The plump extremities, torso and full cheeks of this infant are typical features of an LGA baby.

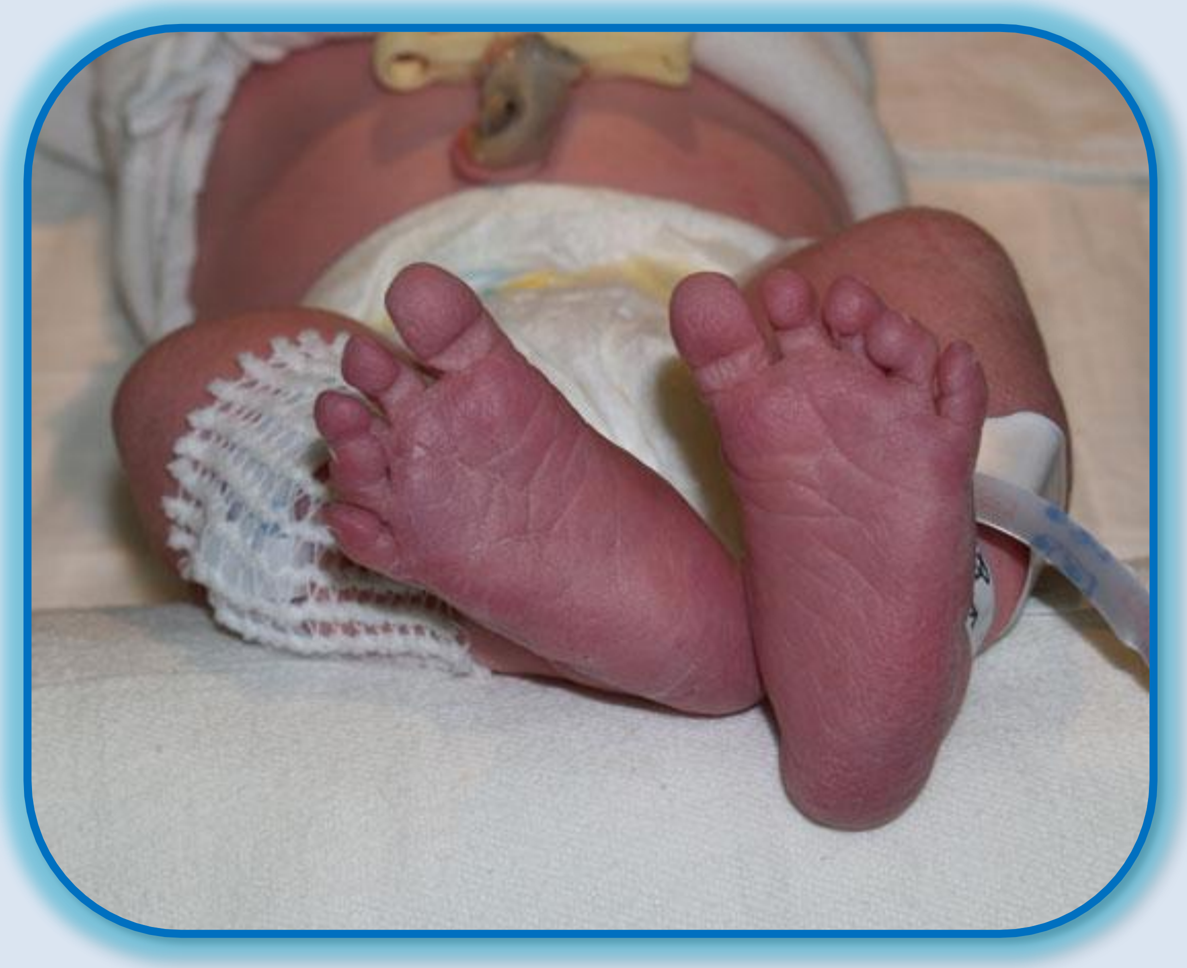
Discordant Size



When it comes to evaluating multiples, comparison of size between individuals is also important. **Discordance between siblings may indicate placental inequalities, twin-twin transfusion syndrome, or other problems.**

The smaller twin, weighed 5 pounds and the larger one was over 6 pounds. **Hematocrits** were checked on both and were normal.

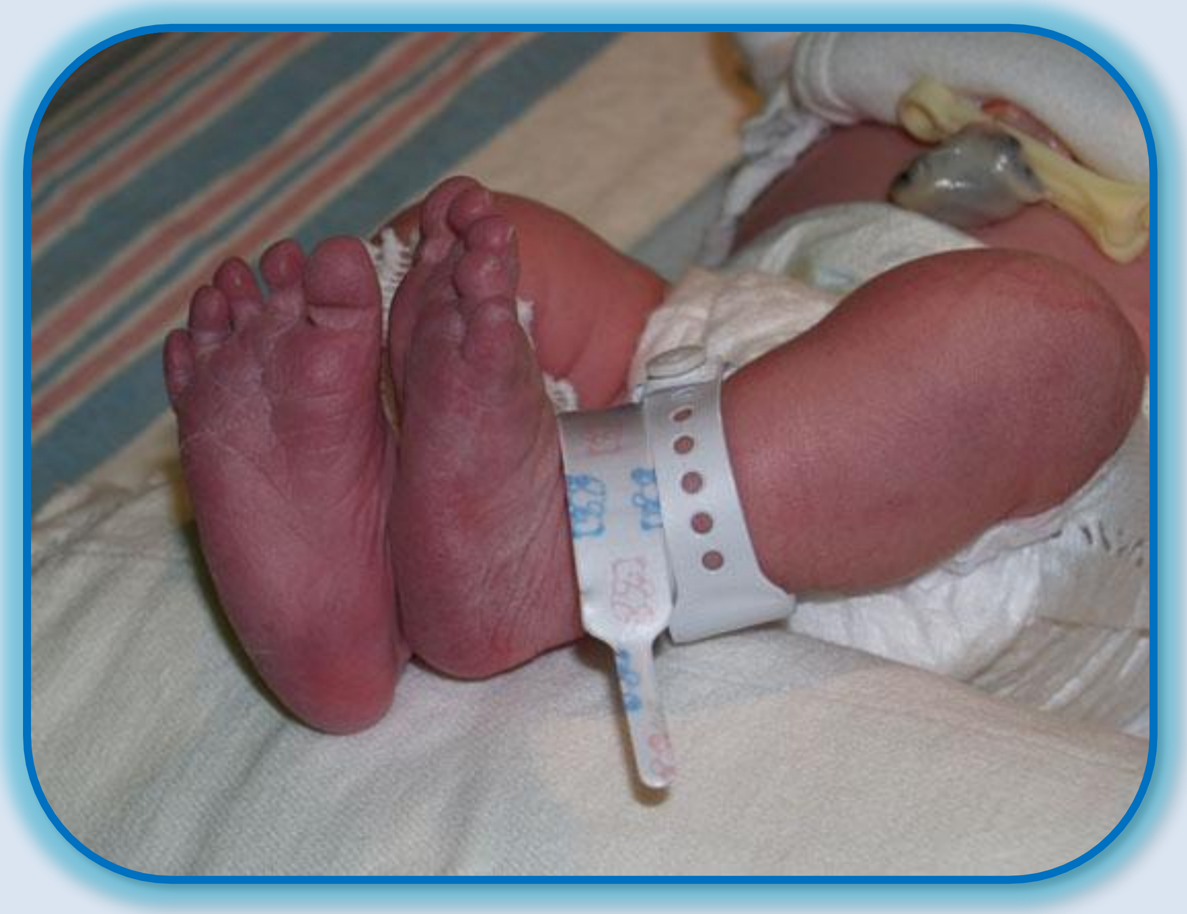
Acrocyanosis



Shortly after birth, cyanosis of the hands, feet, and perioral area are common findings. Notice the difference between the color in the feet and the color of the legs and abdomen.

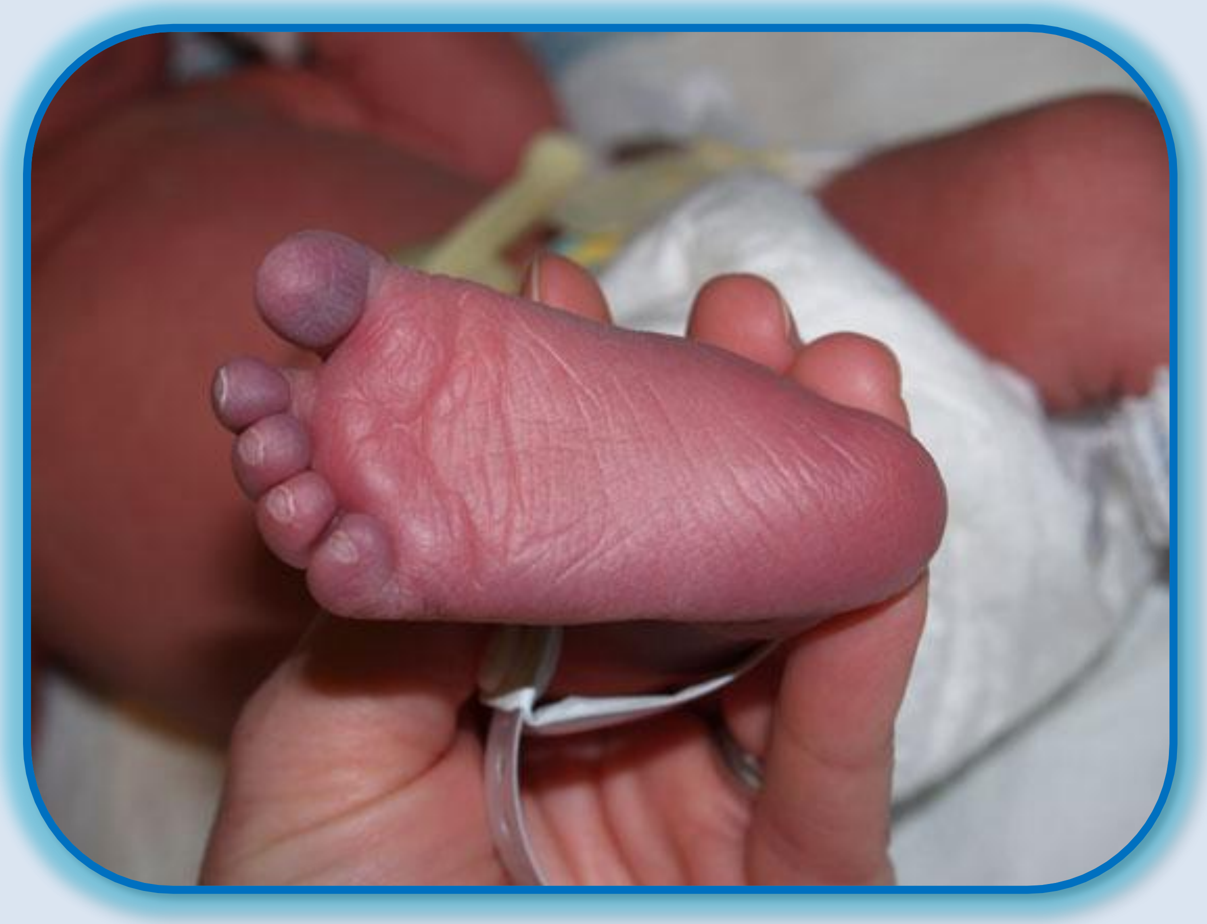
Acrocyanosis typically resolves in 24 - 48 hours.

Acrocyanosis



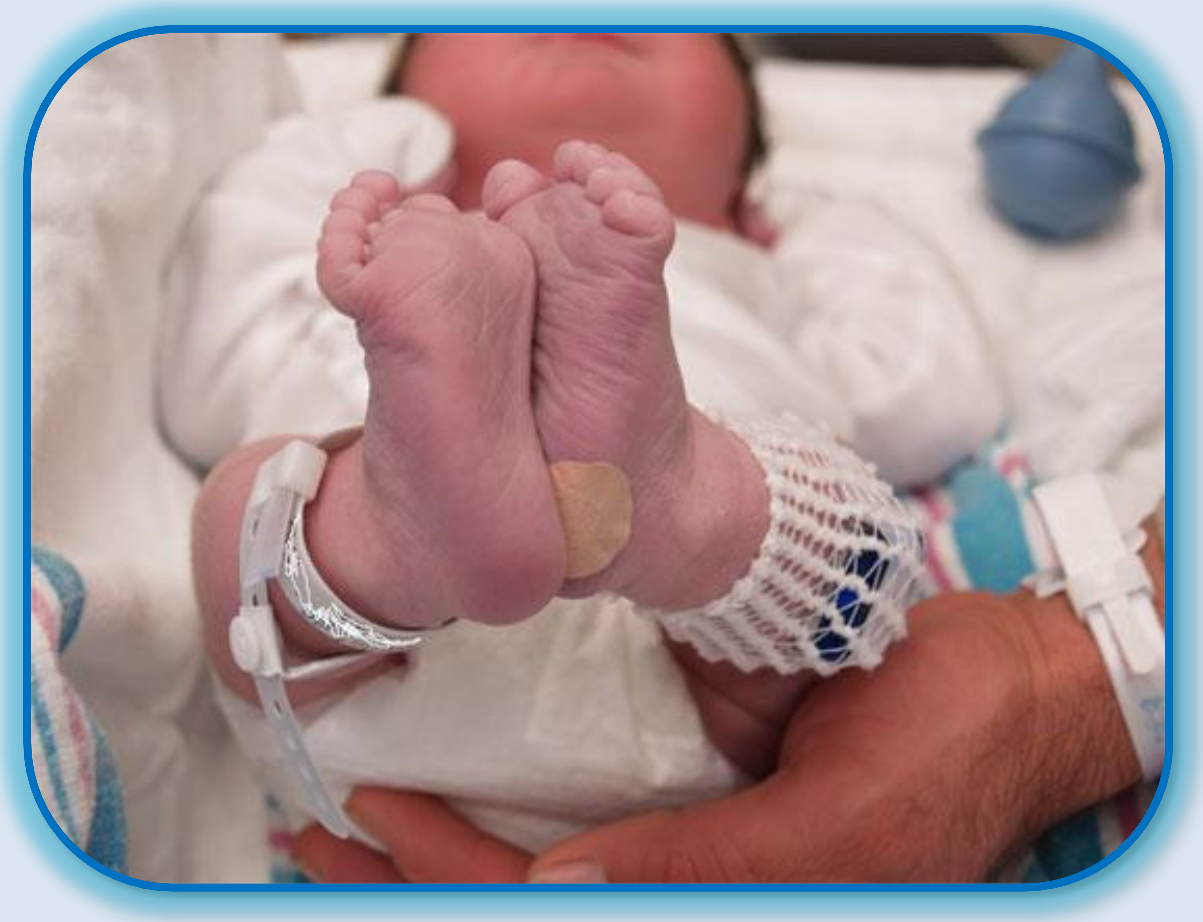
Note the contrast between the feet and the color of the right leg.

Acrocyanosis



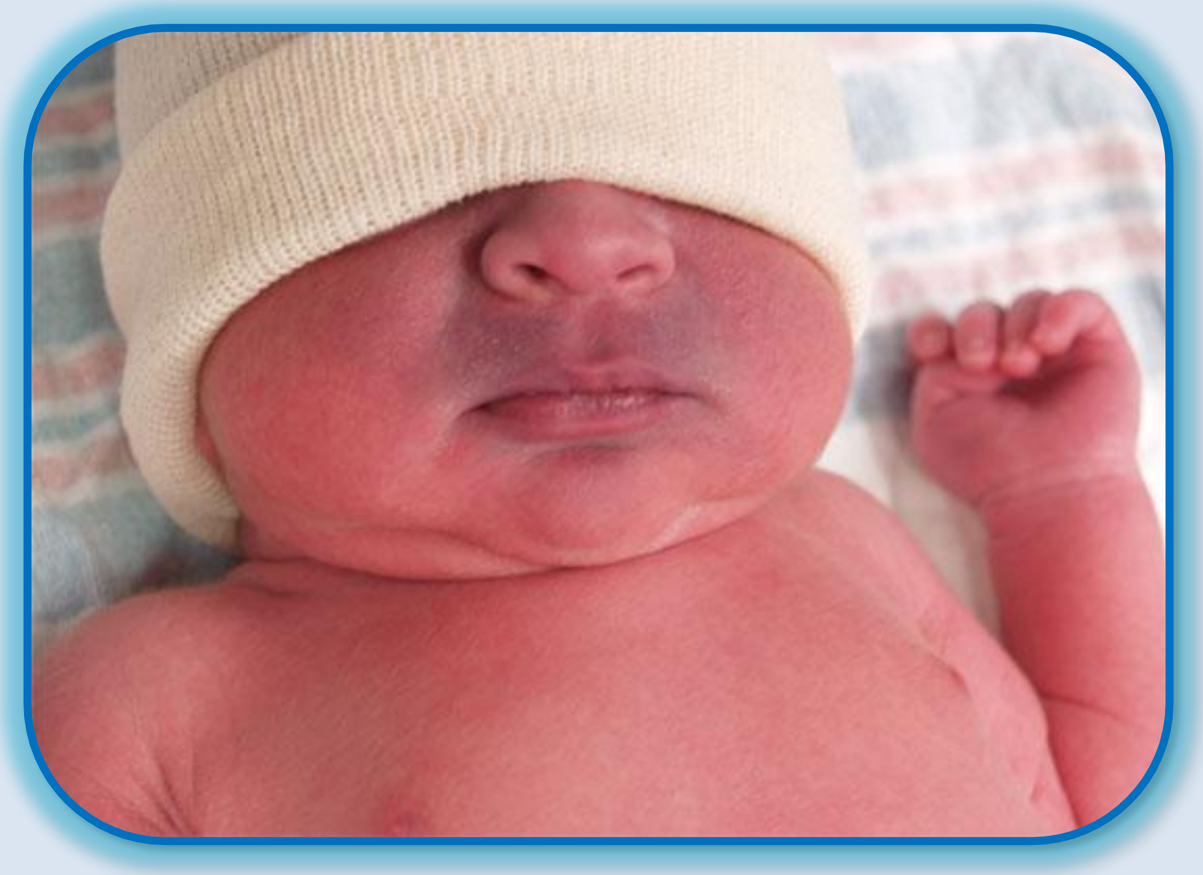
As this infant is **transitioning**, the blue color on the feet is starting to resolve over the upper part of the sole, but is still clearly present in the toes and, to a lesser degree, on the rest of the sole.

Acrocyanosis



Here again, the cyanosis of the feet is apparent in comparison to the parent's hand and the baby's chin.

Perioral Cyanosis

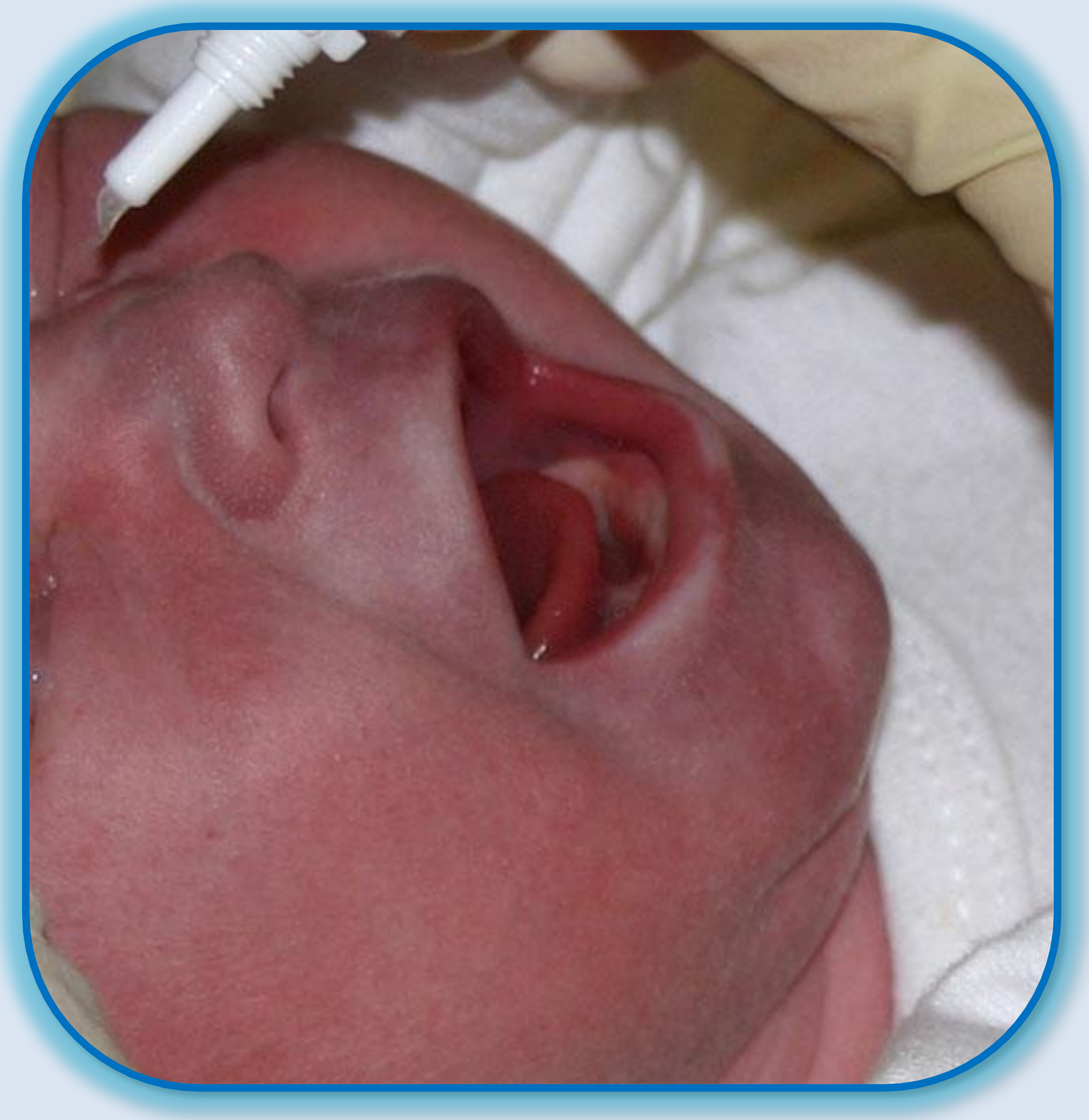


A blue color around the lips and philtrum is a relatively common finding shortly after birth. This is part of acrocyanosis.

The skin in this infant is visibly well perfused, and the tongue and mucous membranes in the mouth were pink, a finding that assures the examiner that central cyanosis is not present.

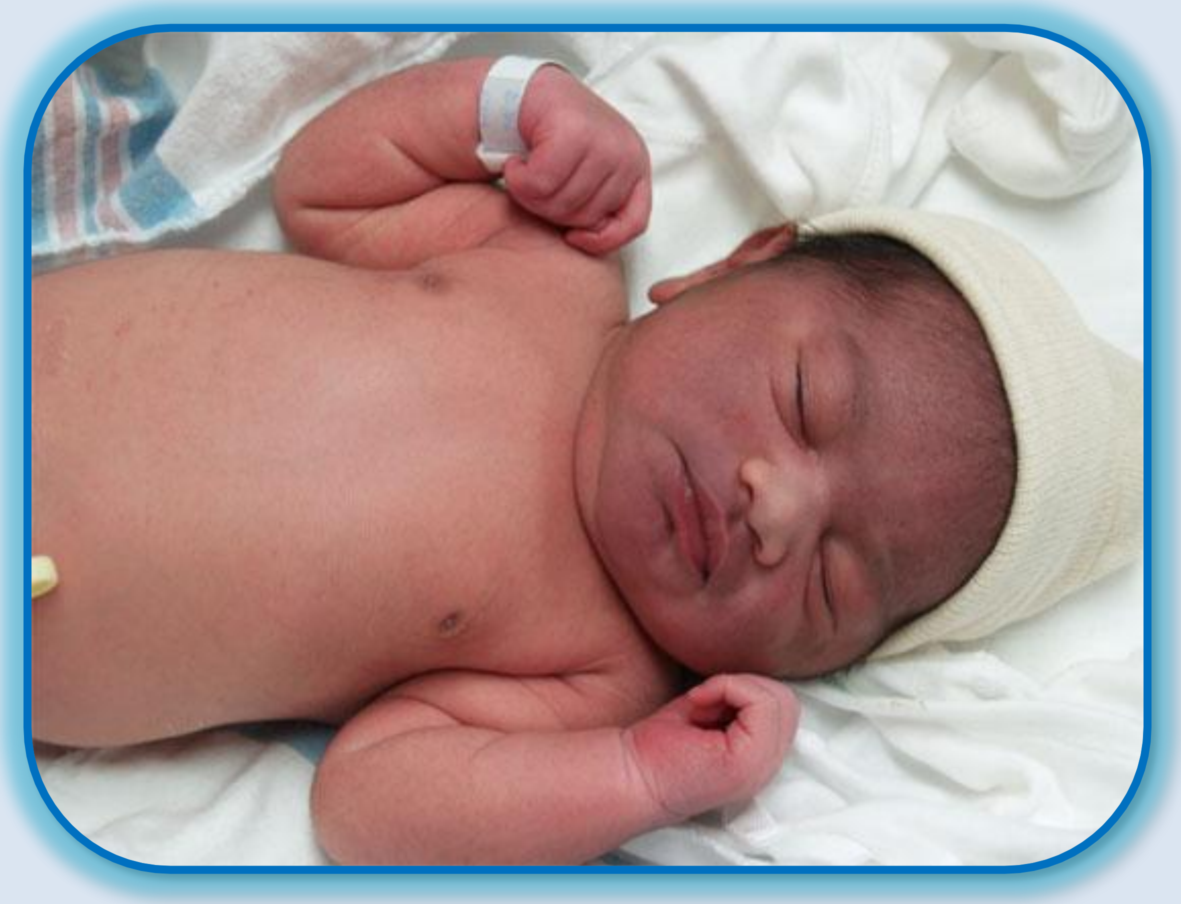
This finding resolved spontaneously over the next 48 hours.

Perioral Cyanosis



Another newborn with perioral cyanosis clearly demonstrates that although the philtrum and upper chin have a dark tint, the lips and tongue are bright pink.

Facial Bruising



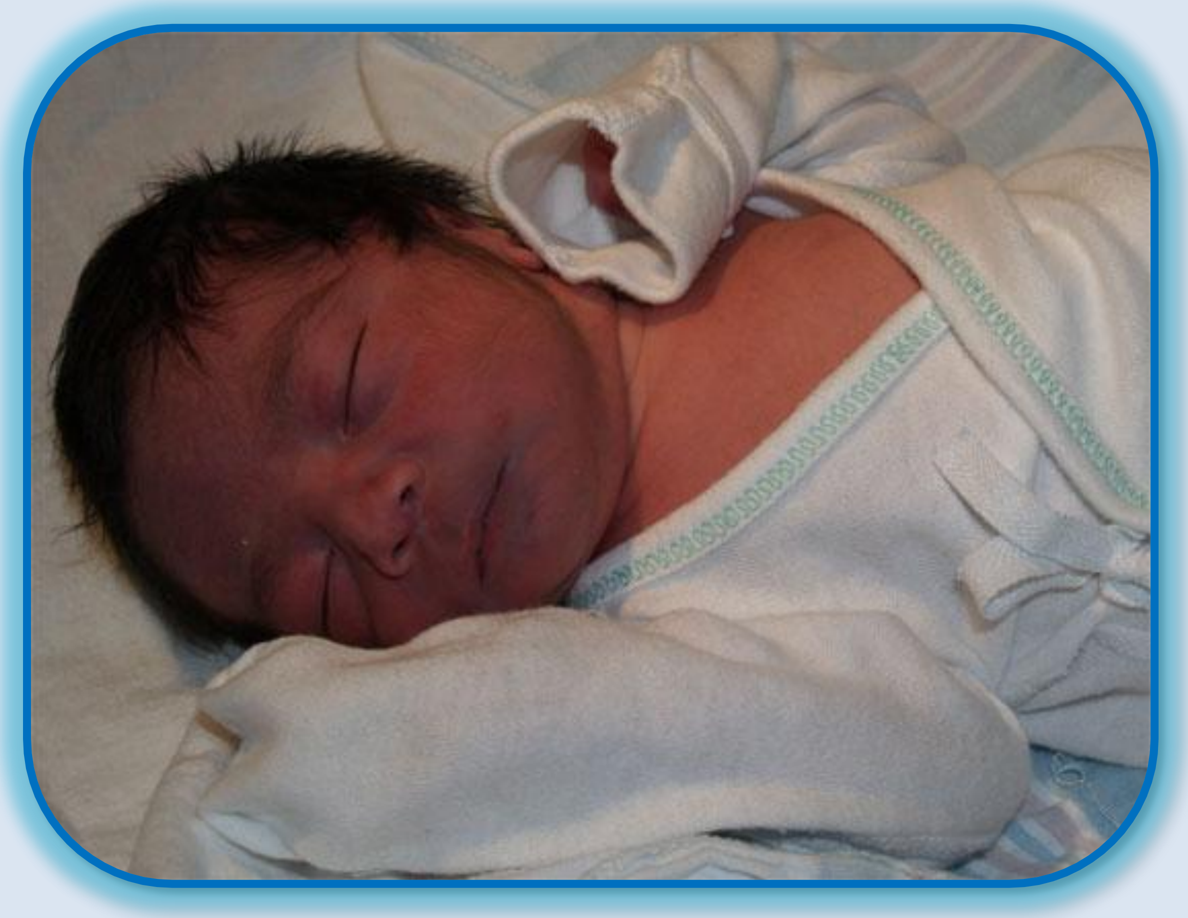
Marked bruising of the face can occur during delivery.

It is more common when there is a tight nuchal cord, **when the delivery is precipitous** or difficult, or when the infant is large.

When the infant is bundled, this facial appearance could be **mistaken for cyanosis**, but with a quick comparison to the color of the rest of the body, the diagnosis is obvious.

This type of bruising resolves over the course of several days.

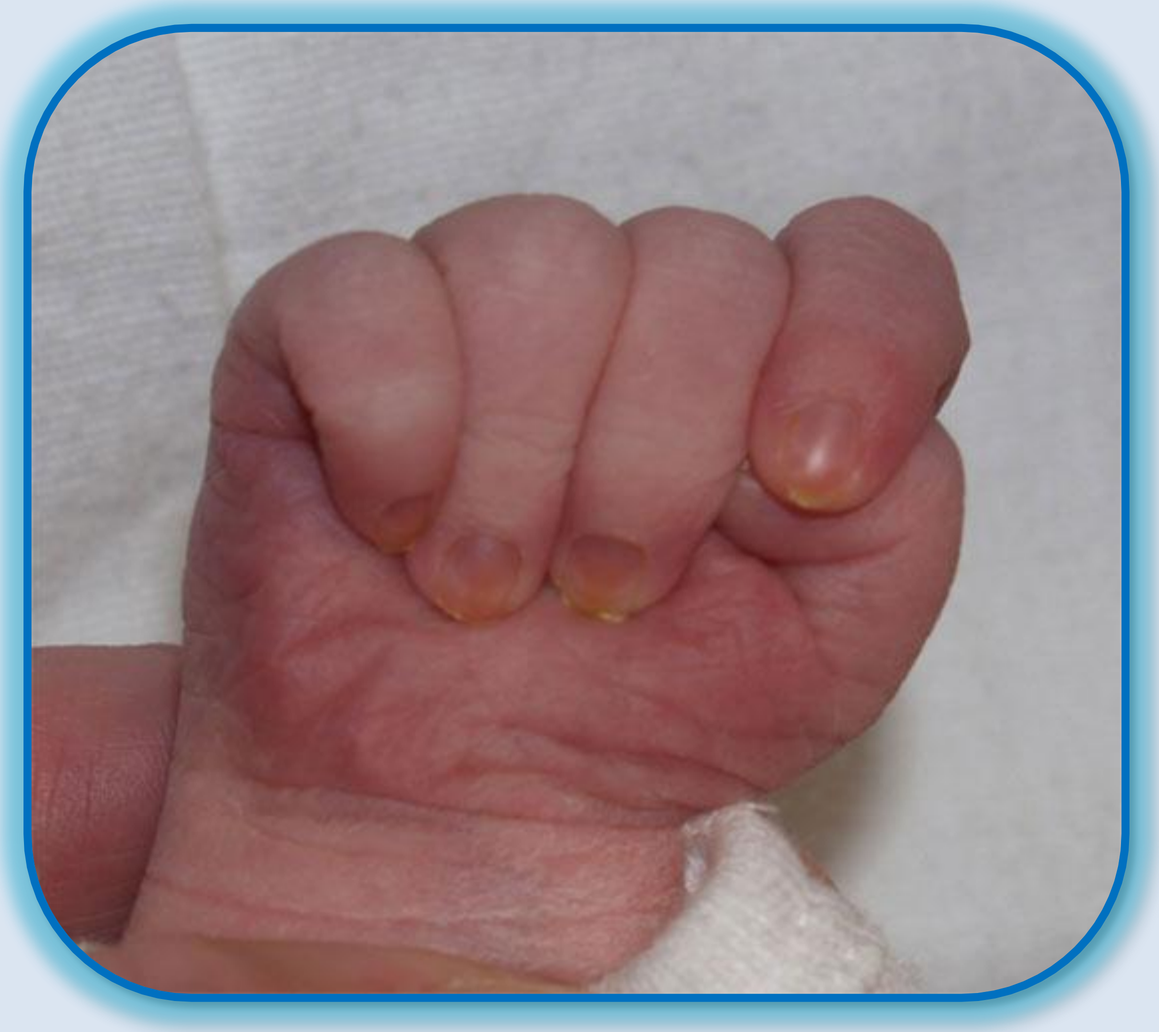
Facial Bruising



Here again the **face appears to be cyanotic** (including the lips), **but** the tongue and the rest of the body had a normal pink color.

On careful examination, **petechiae** where also noted across the forehead. This is another manifestation of bruising in a newborn; **no further evaluation is needed**.

Meconium Staining

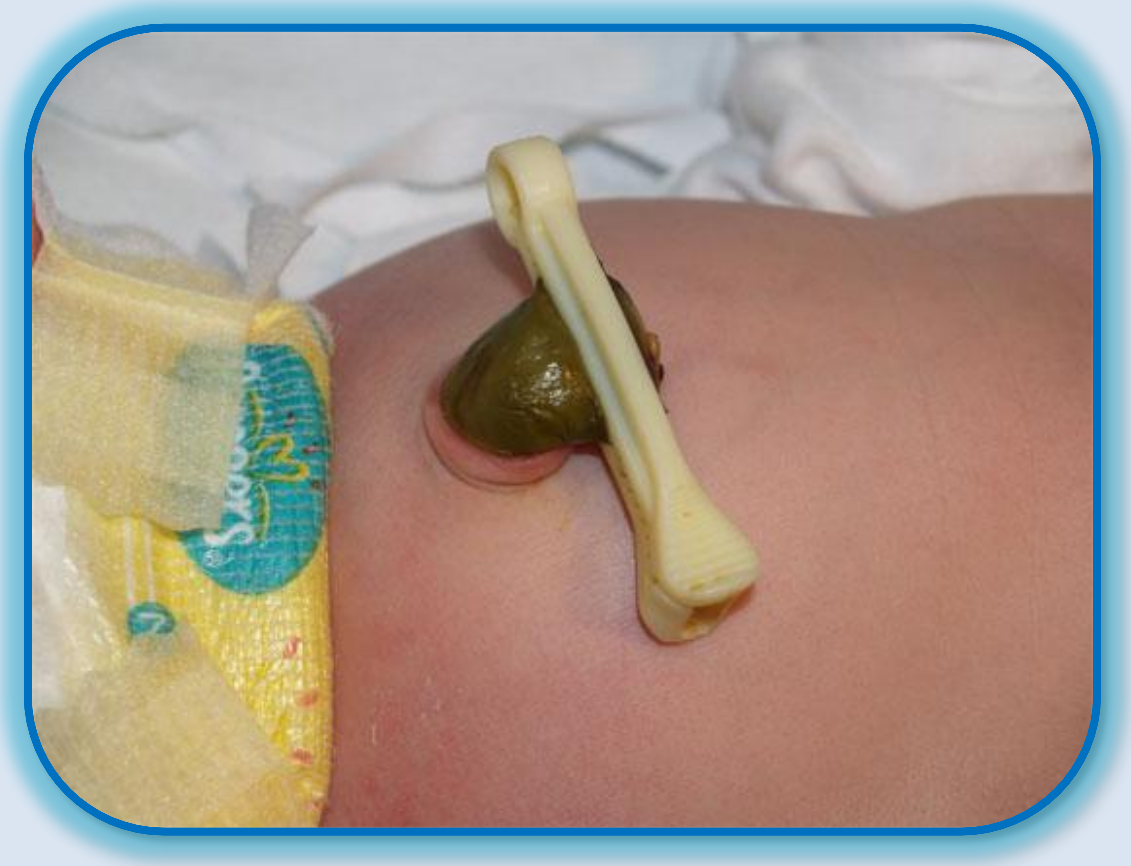


Evidence of meconium staining in utero may be a clue to an infant who was **stressed before birth**.

Meconium staining can be appreciated on the fingernails **(yellow tint)**. Normally, the nails are white. This suggests that the meconium was present in utero for some time prior to delivery.

Staining may also be seen on the umbilical cord and the skin.

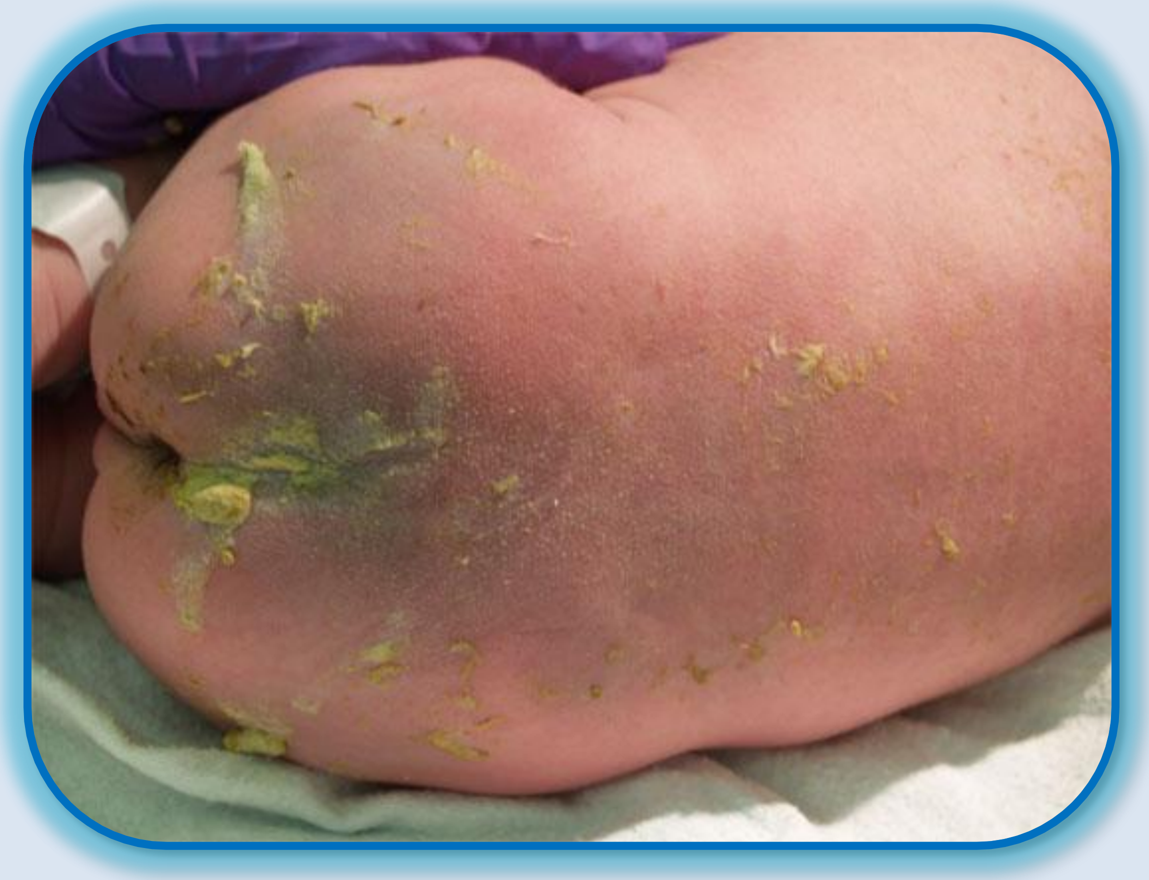
Meconium Stained Umbilical Cord



This cord is about 7 hours old, but the normal light yellow color is not visible, even though the cord is still plump. It is the presence of meconium in the amniotic fluid which gives it a dark green color.

Although meconium staining has no direct effect on the infant, the presence of meconium is often **associated with in utero stress**.

Meconium Staining

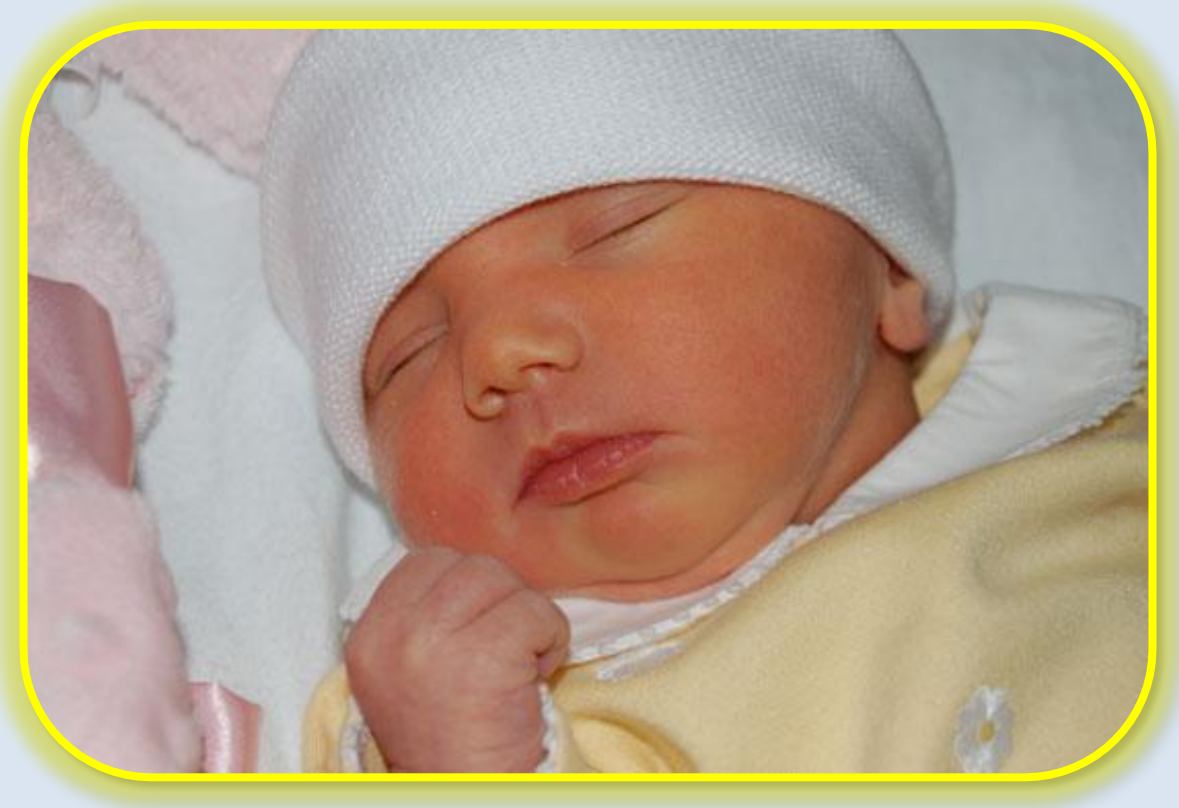


In this infant, it is not the skin itself, but the vernix that shows evidence of meconium in the amniotic fluid.

Vernix caseosa is the pasty, cheese-like, material present in varying degrees on the skin at birth. It is a mixture of sebum produced by the infant's skin and cellular debris that has accumulated in utero.

Normally, vernix is a creamy white color. The yellowish brown tint seen in this photo is a result of meconium staining.

Jaundice

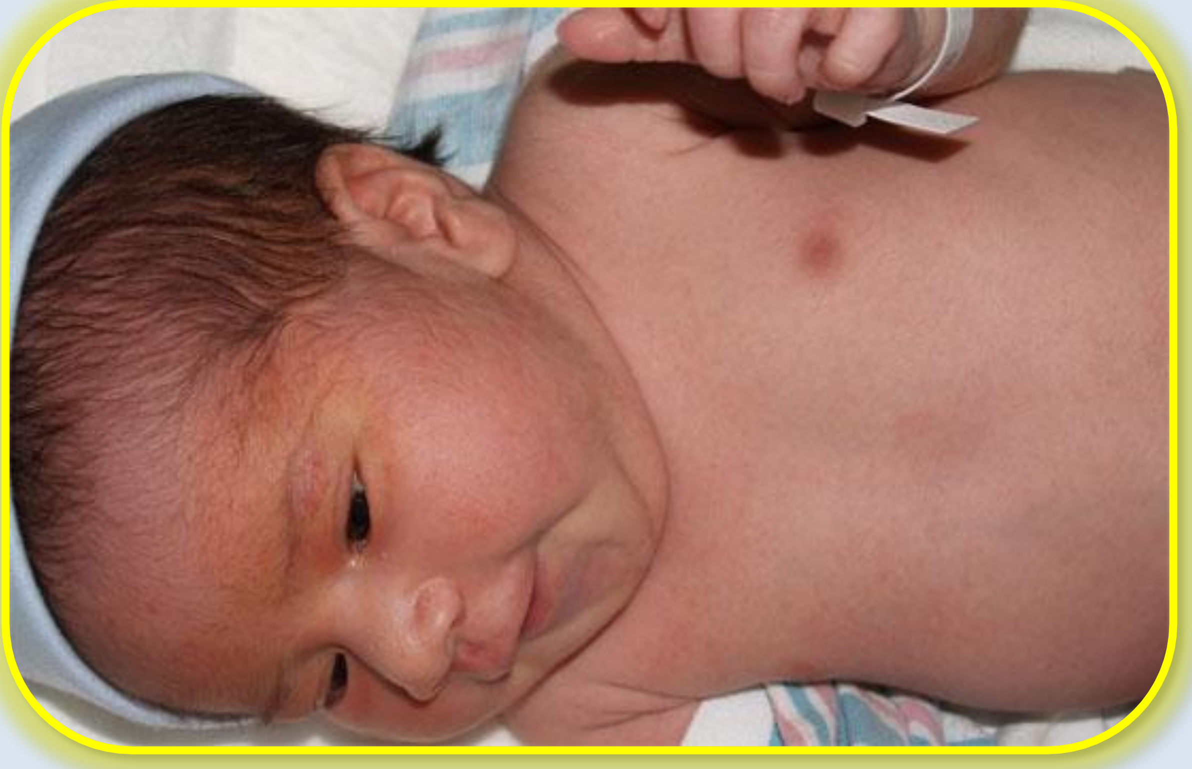


When assessing jaundice comparisons are useful.

Since the type of lighting in a room can dramatically affect the appearance of the skin, comparing the infant's color to the parents' color, or comparing the facial color of the infant to the color of the infant's feet can highlight differences.

If one is just looking at the face of this infant, the yellow tint might be thought to be the baby's skin tone. **Here the hand provides a nice contrast & much whiter.**

Jaundice

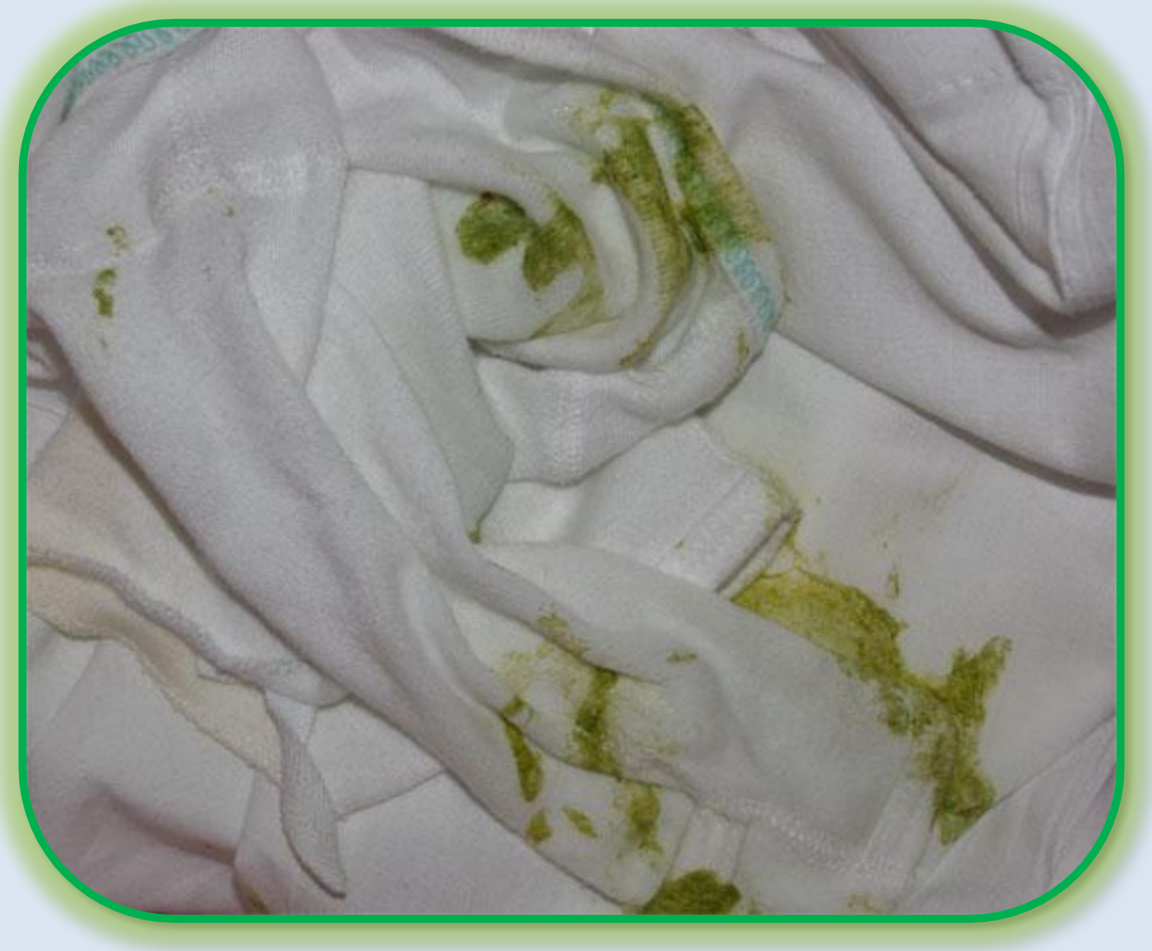


It is important for the examiner to understand that babies who are undergoing phototherapy treatment have an unreliable skin exam due to the **temporary "bleaching" effect of phototherapy on exposed skin**.

Here, minutes after the baby is removed from under the blue lights, a clear color demarcation can be seen between the skin that was under the eye cover and the skin that was exposed to the lights.

Serum bilirubins are the only useful measure of progress with phototherapy.

Bilious Emesis

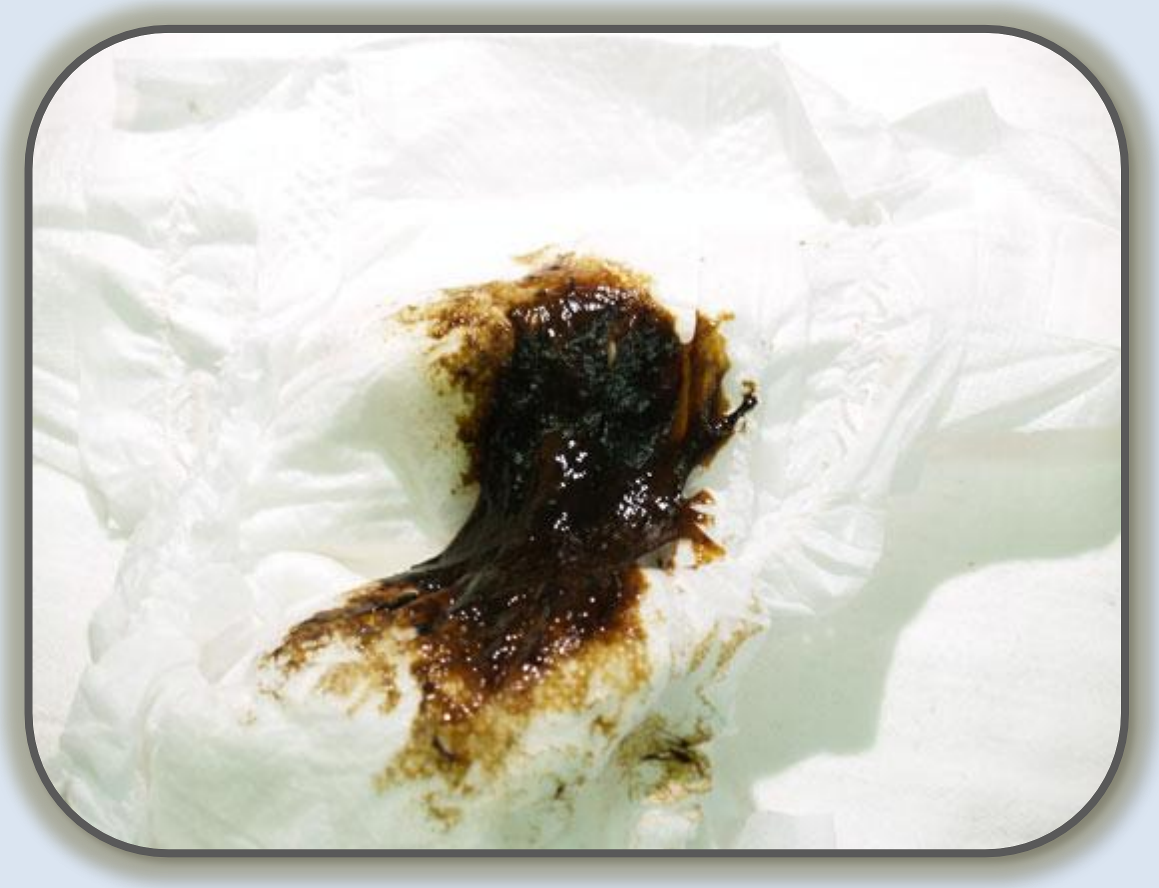


This is an example of bilious emesis (green color).

This newborn was thought to be well and was tolerating feedings for several days before the sudden onset of this abnormal emesis. **Malrotation with volvulus** was diagnosed and the infant underwent **emergent surgical correction**.

Emesis like this is never normal.

Meconium



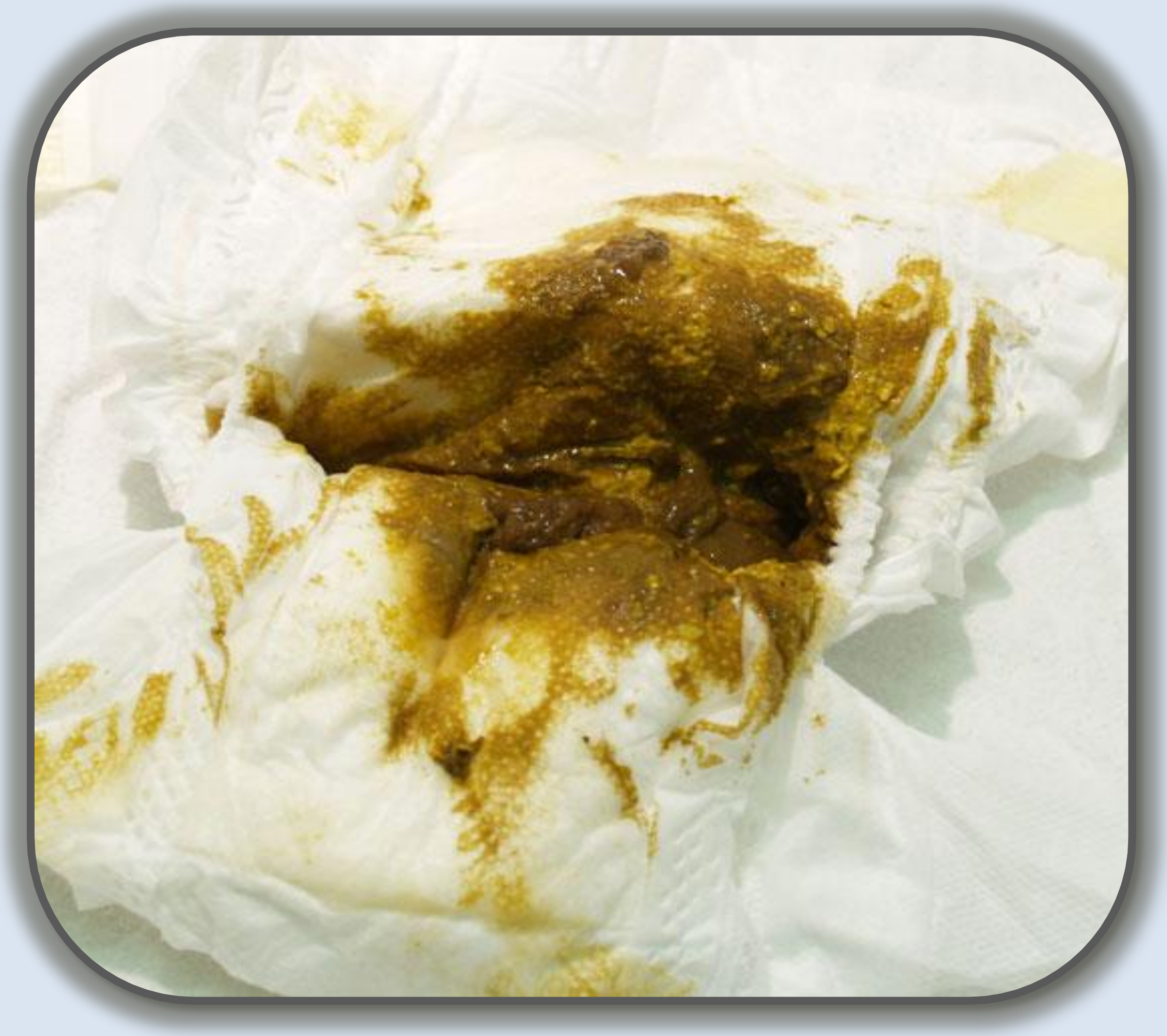
Meconium stools are characterized by their **dark** color (almost black), **sticky** consistency and **odorless** nature.

Normal passage of meconium should include at least **one stool in the first 48 hours** after birth and end with the onset of transitional stools by day 4.

Delayed passage of meconium should prompt consideration of Hirshsrung's disease or conditions associated with meconium plugs.

Delayed conversion to transitional stools should prompt evaluation of feeding adequacy.

Transitional Stool

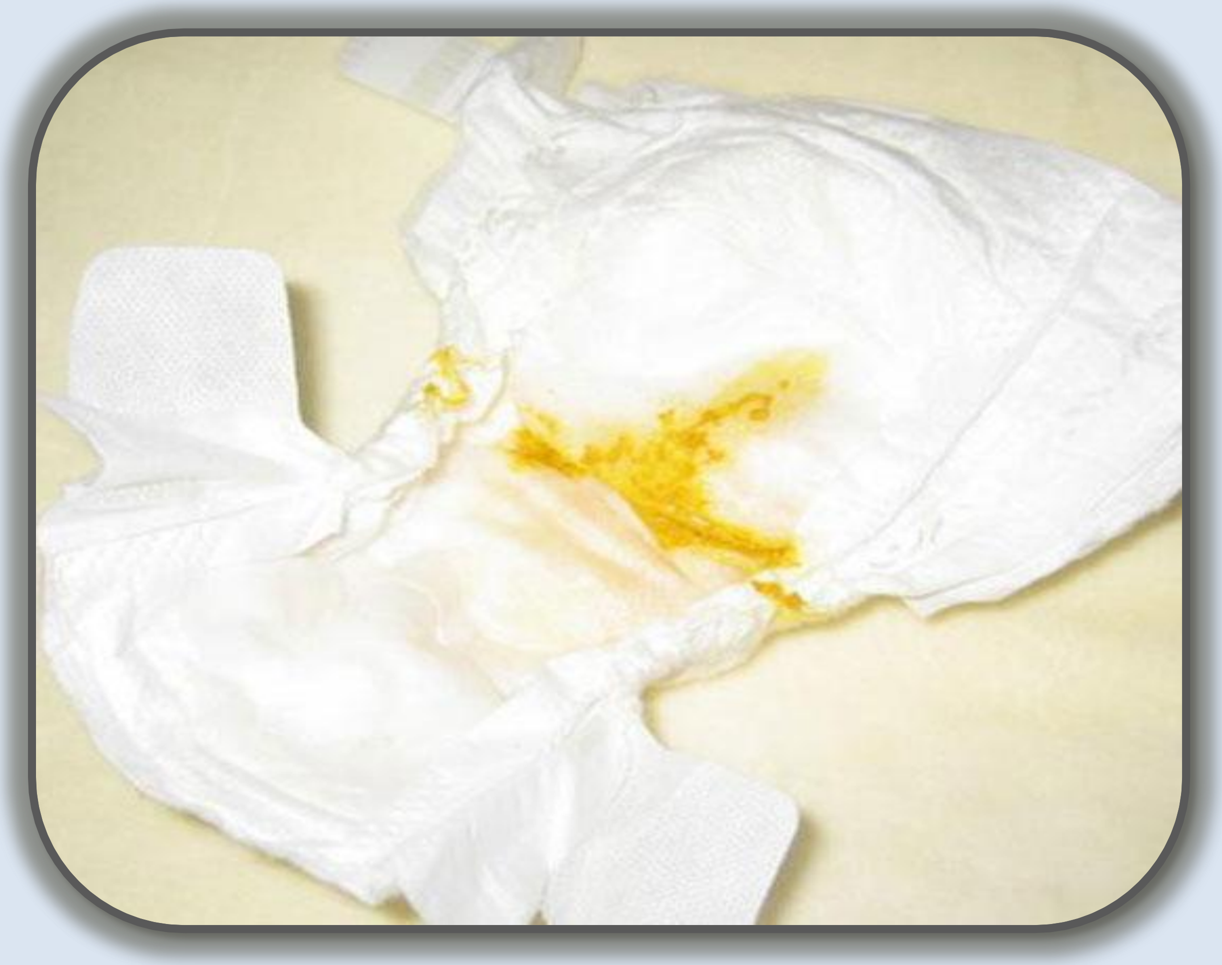


Transitional stool represents the change from meconium to the normal yellow, seedy stools that characterize infants feeding on milk only.

Here, the dark color of meconium is still visible, but lighter, yellowish curds can also be seen.

Exclusively breastfed infants should have transitional stools by day 4 if feedings are adequate.

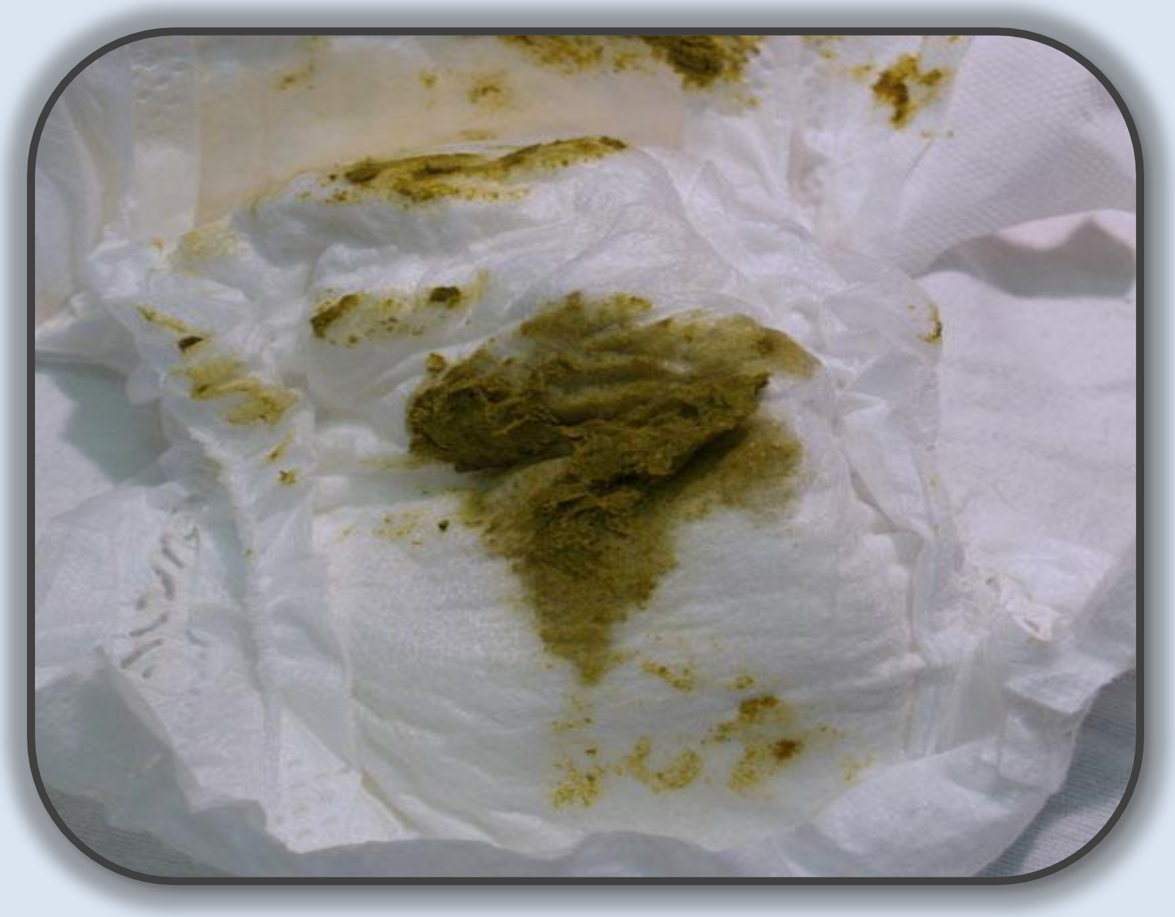
Yellow Stool



This is the normal appearance of stool in an infant who is exclusively breastfed. This appearance is typically described as **"bright yellow and seedy"**. Note there is a significant amount of liquid stool absorbed into the diaper with only some solid material on top. **This is sometimes thought to be diarrhea by parents, but it is not**.

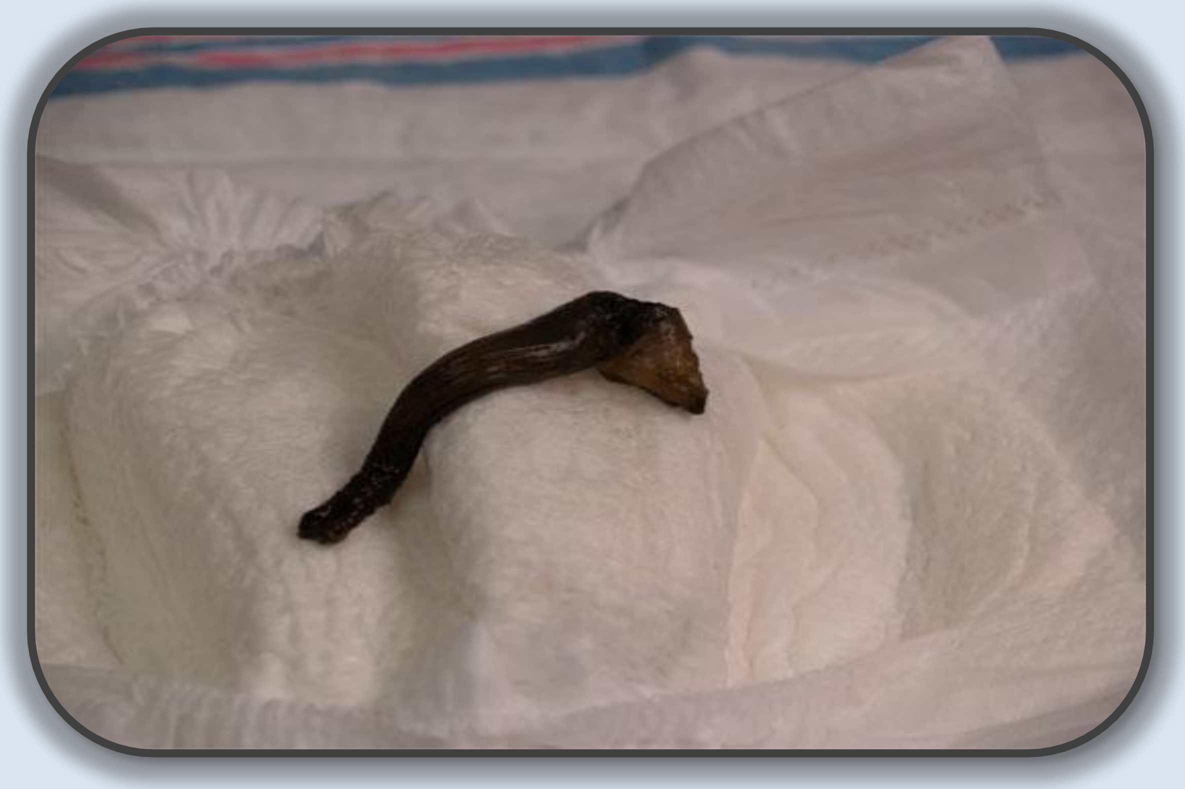
The presence of this type of stool **by day 5** is a reassuring sign that the infant is being well fed.

Normal Stool



This is the stool of a 2 week old infant who was being fed an extensively hydrolyzed formula. The stool is normal, but has less of the bright yellow, seedy consistency of a breast-fed infant stool.

Meconium Plug



Here is an example of a stool that is **not normal**. This is a meconium plug. It is a **very viscous**, **congealed mass** of meconium that may either be spontaneously passed or **may create an obstruction** and be the cause of delayed passage of stool. Typically, after the infant passes the plug, the subsequent stool is normal.

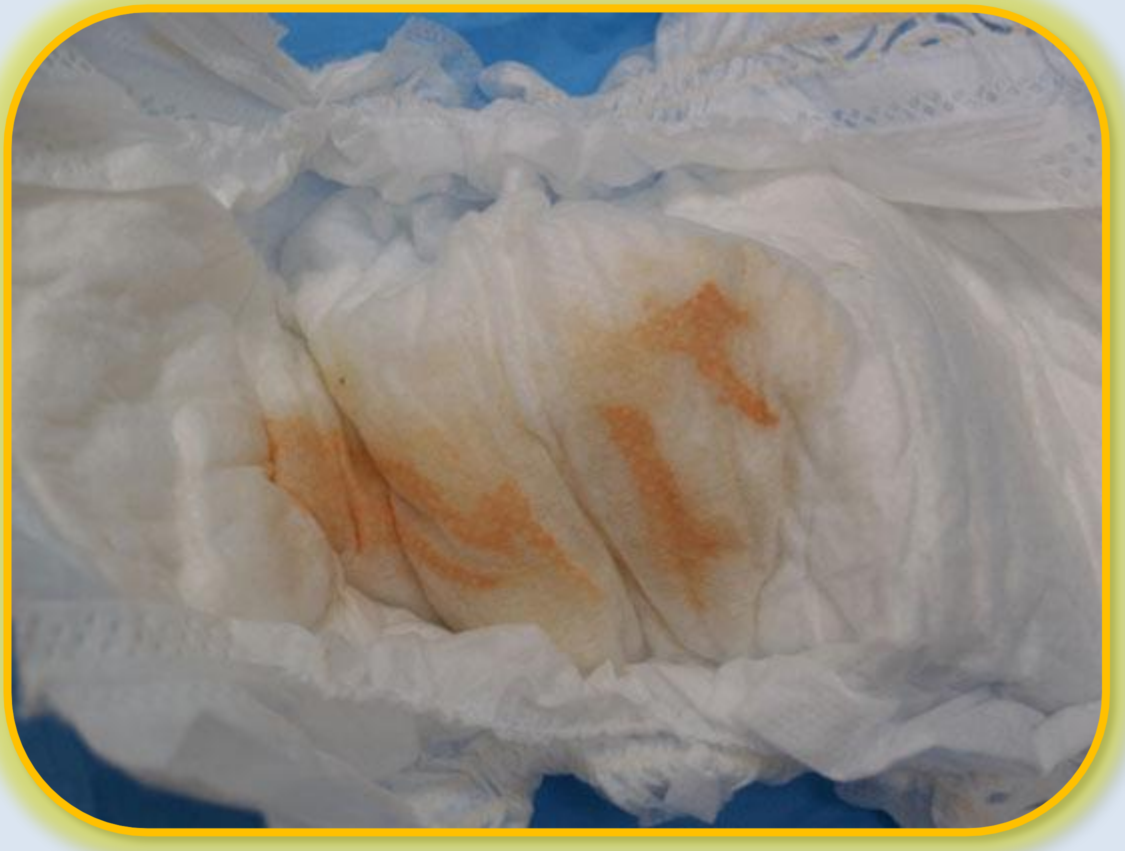
Although there is a known **association** between an underlying diagnosis of **cystic fibrosis (CF)** and meconium plug, many infants with this finding do not have CF.

The majority of cases are thought to be caused by an **immaturity of the ganglion cells** of the colon, leading to a transient impairment of colonic function. **Maternal diabetes and prematurity are known risk factors**.

Normal Urine

Normal urine soaked into a diaper. Because of the absorbency of disposable diapers, the surface will not feel wet, even with this considerable amount of urine. **If knowing output is important, dry and wet weights of the diaper can be measured.**

Urate Crystals



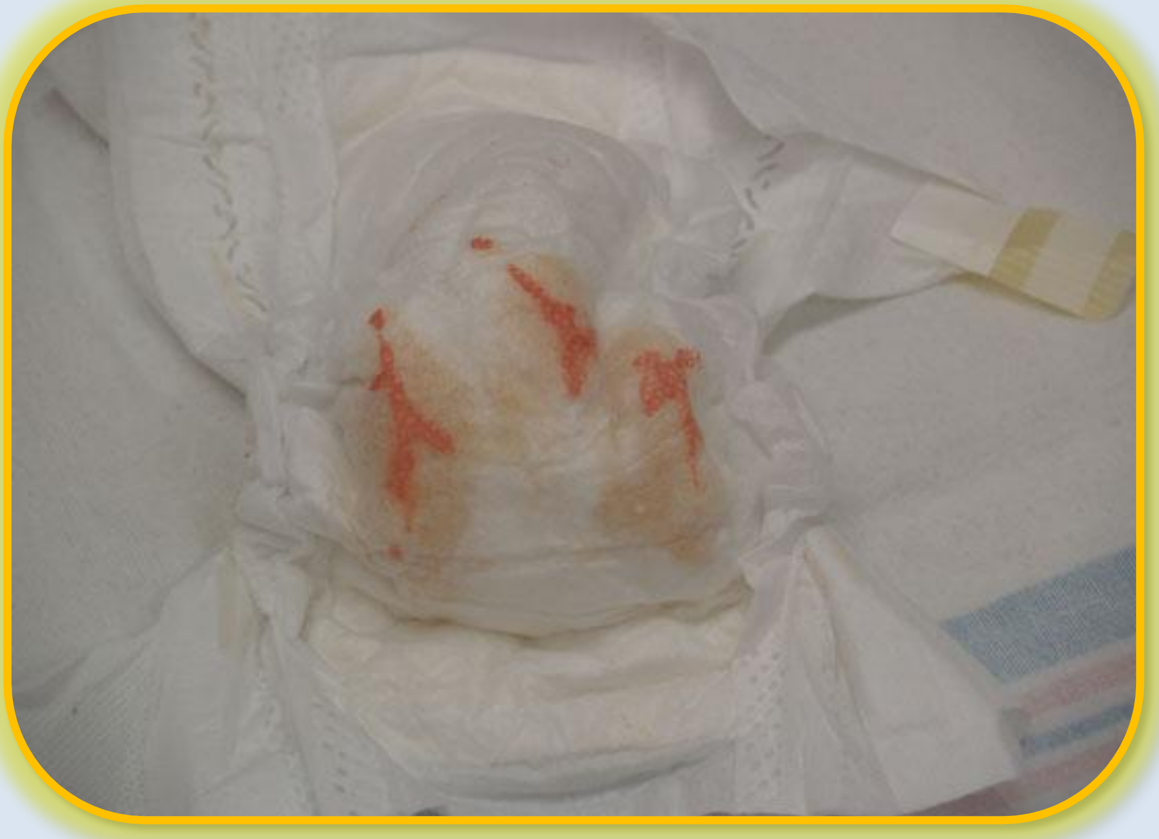
Often mistaken for blood in the urine.

Urate crystals are a frequent intermittent finding in the **first week**.

The characteristic appearance of **pink-orange** material is sufficient to make the diagnosis.

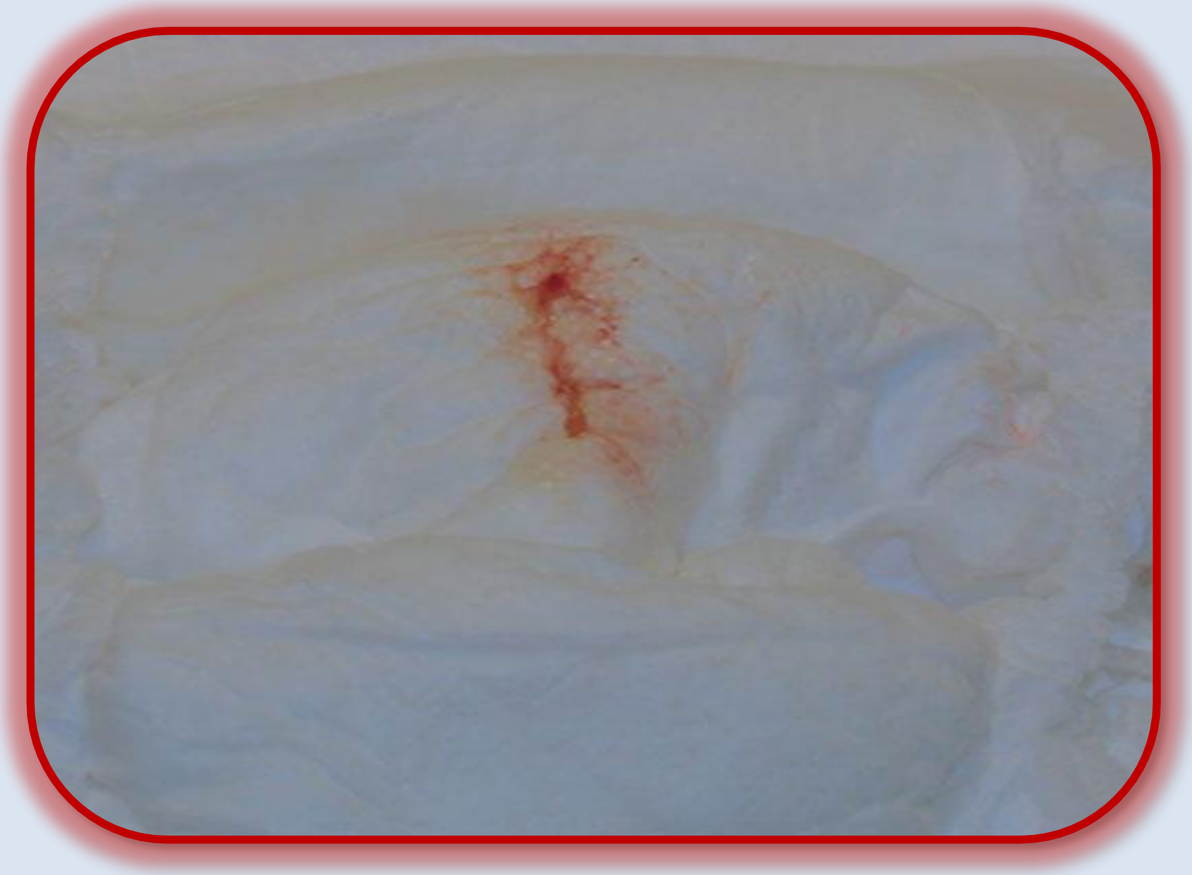
No laboratory analysis is needed.

Urate Crystals



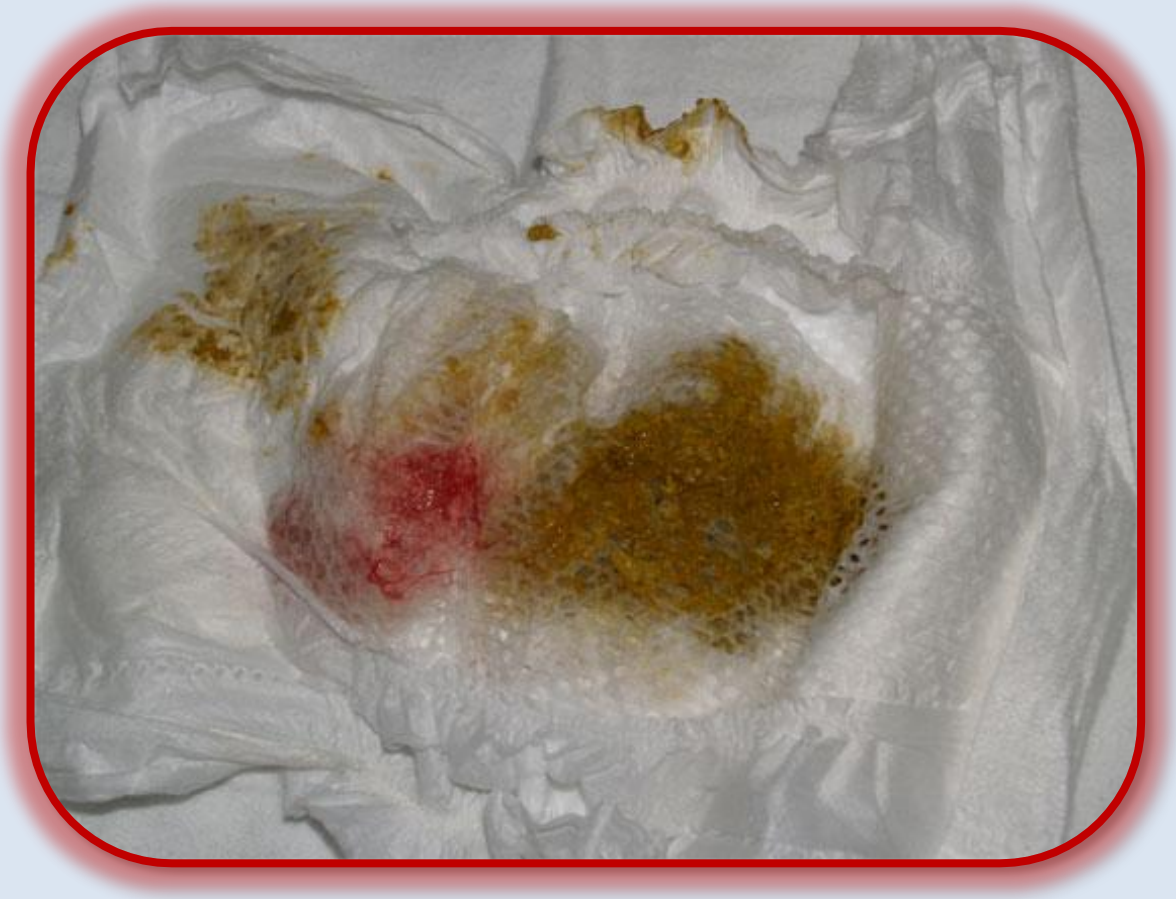
Another example of urate crystals in a diaper. Even in the urine-soaked areas, a pink tinge is visible.

Normal Vaginal Blood



This is normal vaginal withdrawal bleeding that occurs in some female infants. Similar to withdrawal bleeding in adolescents, this **typically occurs on the third day after birth**, continues for a few days, then stops.

Normal Vaginal Blood

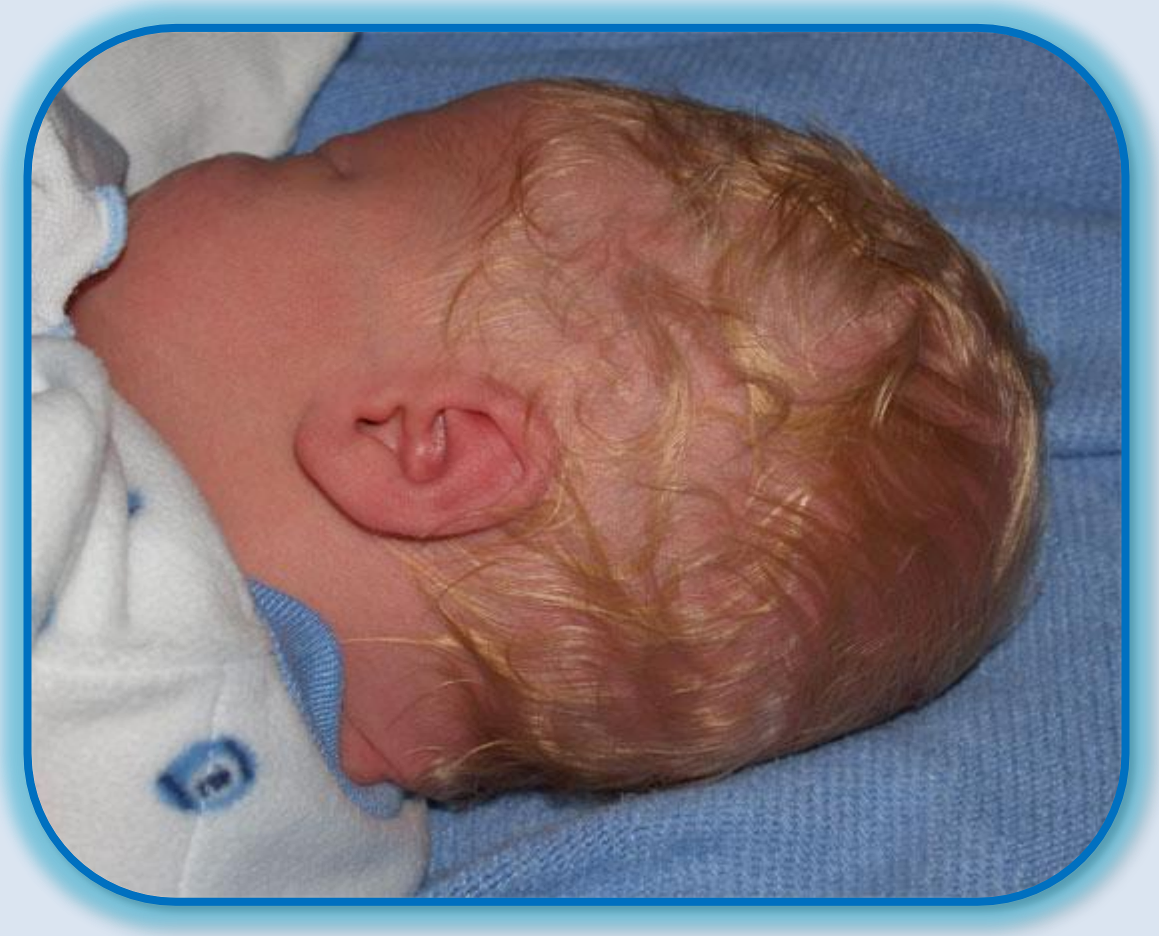


Here is another example of normal vaginal withdrawal bleeding in a newborn girl. For the first 3 days, no blood was noted. This photo was taken of a diaper produced on day 4. On physical exam, blood could be seen in the vaginal area, but was otherwise normal. Bleeding may be noted in every diaper for a couple of days, but will **spontaneously resolve**.

Large amounts of blood are not normal for withdrawal bleeding. If bleeding seems excessive, vitamin K deficient bleeding or other coagulopathy should be considered.

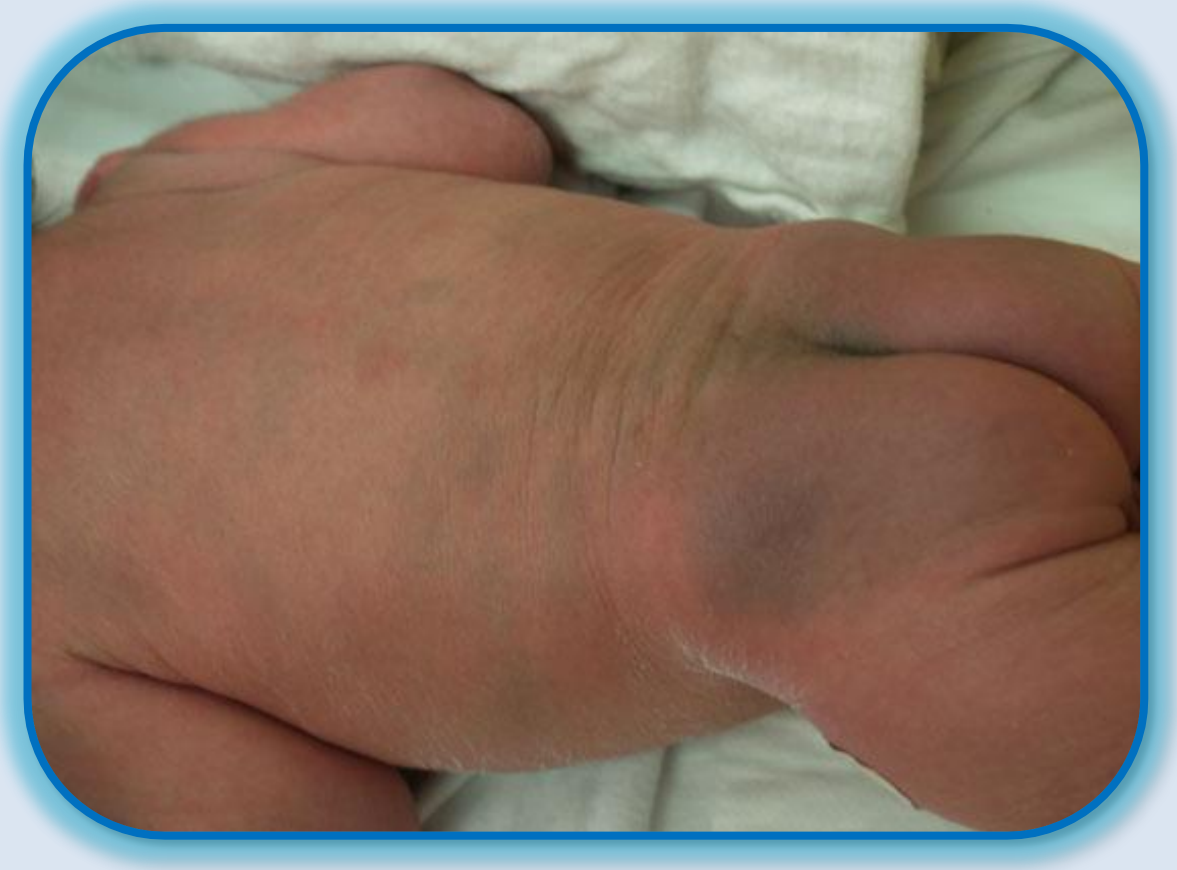
Skin

Albinism



Although the pediatrician's physical examination was unremarkable except for the general hypopigmentation, eye findings consistent with oculocutaneous albinism were noted by the ophthalomologist. These included transillumination of the irises, blonde fundi and vessels running through the macula. Nystagmus was not present at birth, but may be present in this condition as visual acuity is often low.

Slate Grey Patches (Mongolian Spots)



These **dark blue-grey** lesions are most commonly seen in darker skinned infants.

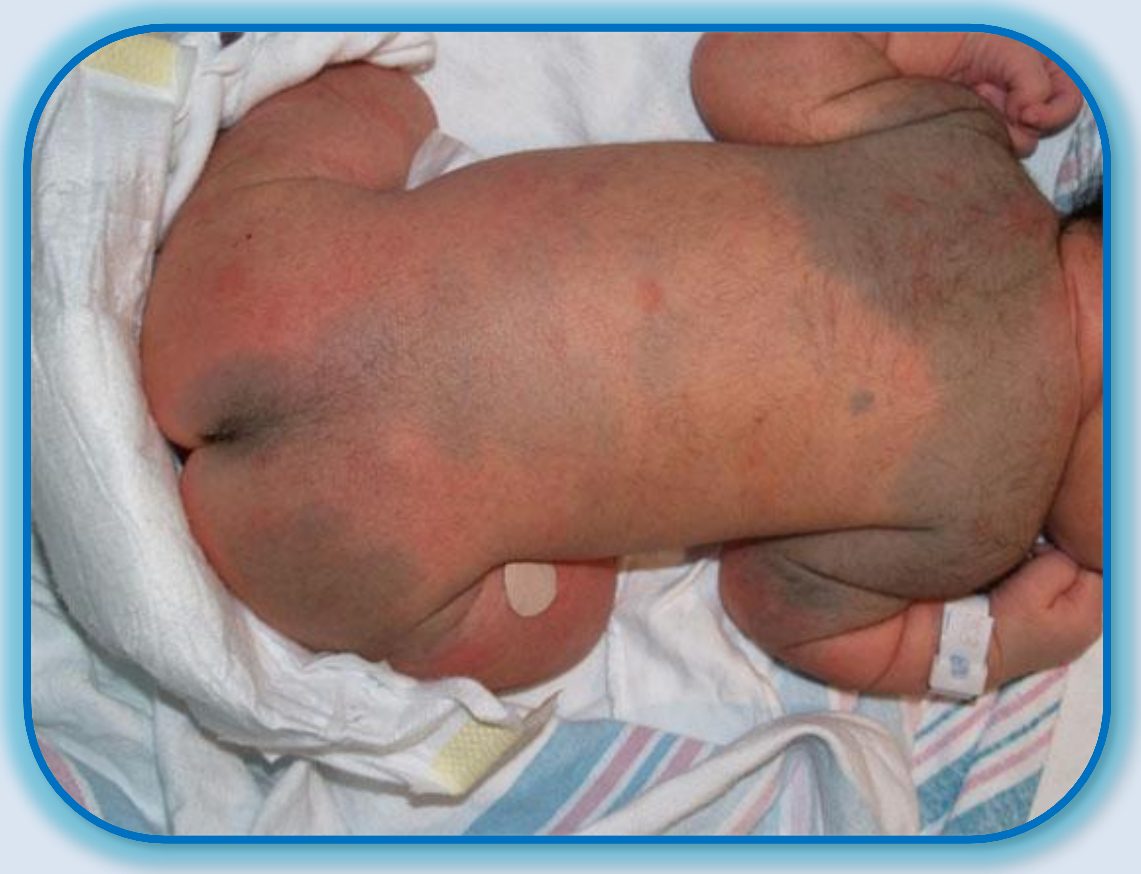
The **sacrum** is the **most commonly** affected area.

These lesions tend to **fade over several years** but **may not** completely disappear.

No evaluation is needed.

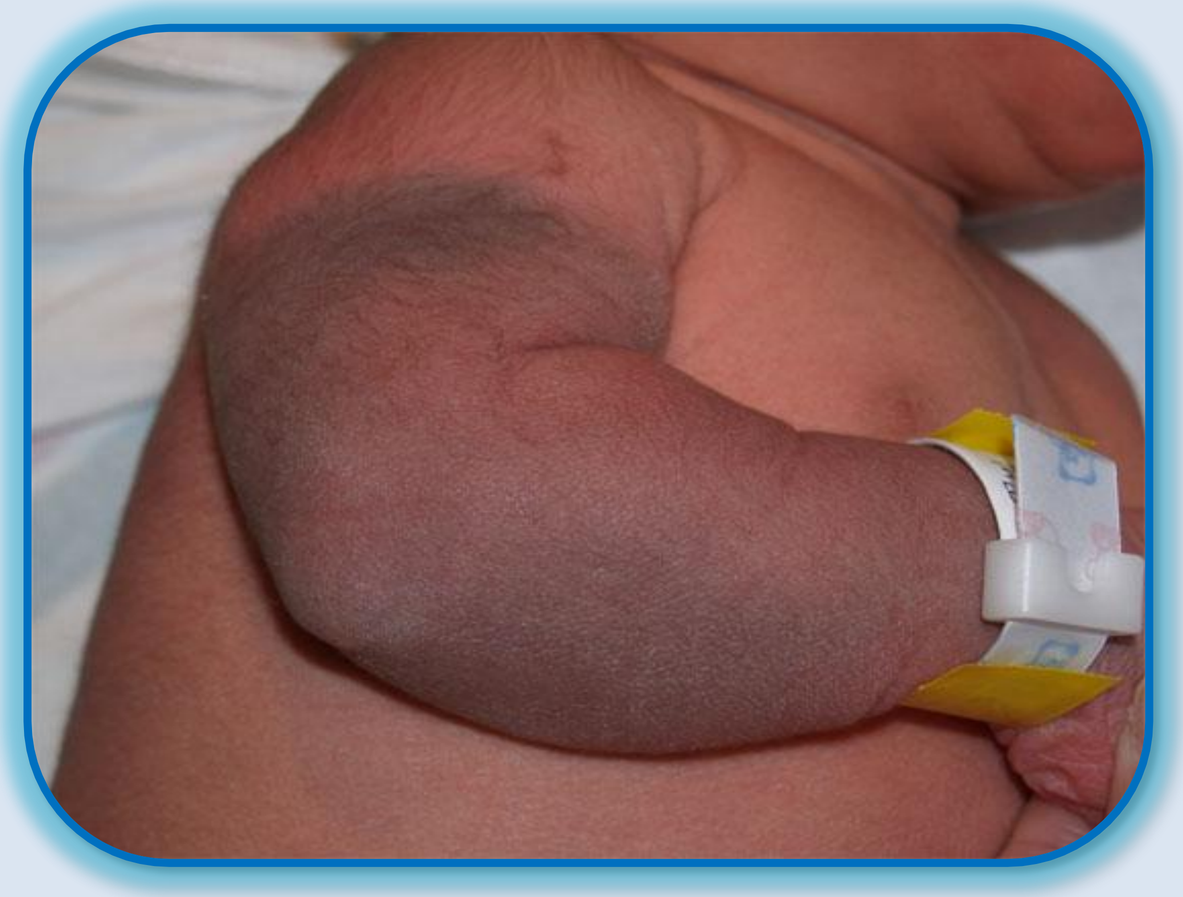
They can be easily differentiated from bruises by the absence of other colors associated with bruises (red, purple, green, brown or yellow).

Slate Grey Patches (Mongolian Spots)



This baby has more intense and widespread lesions.

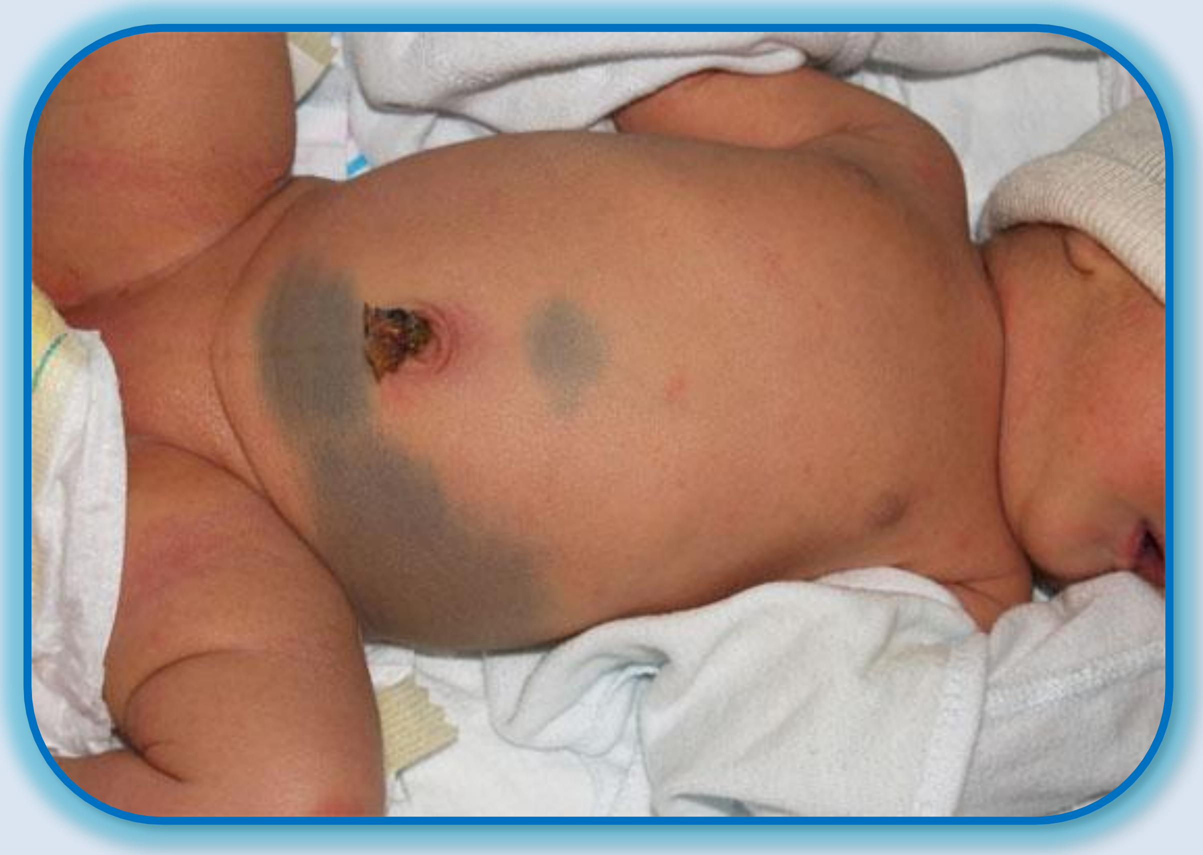
Slate Grey Patches (Mongolian Spots)



Slate grey patches can even involve an entire extremity. It is important to be able to **distinguish** the typical appearance of the patch even in an unusual location, so that **trauma** is not suspected.

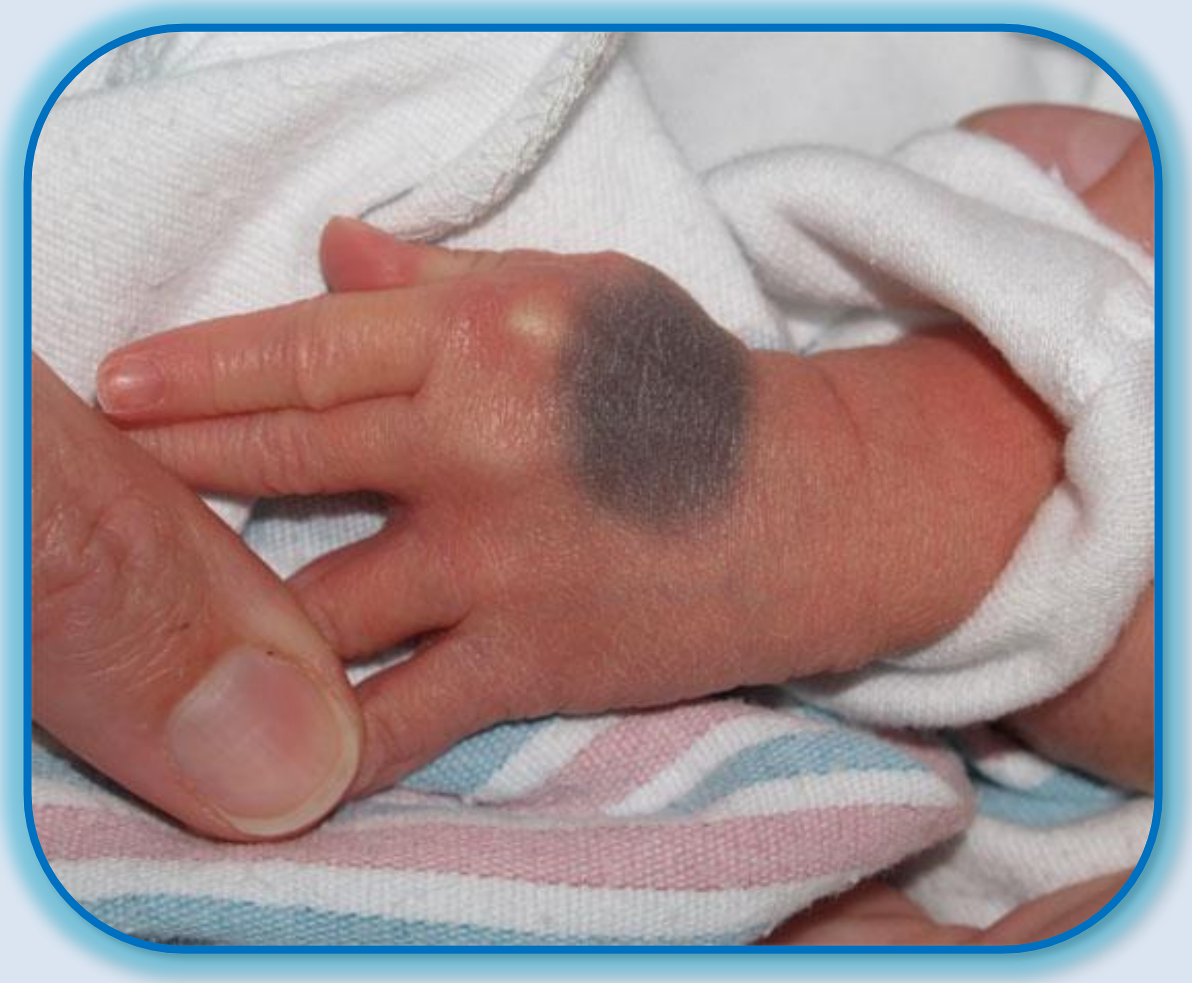
Patches involving a single leg or which are circumferential around both ankles can also be seen. **Documentation** of these unusual birthmarks in the medical record is helpful.

Slate Grey Patches (Mongolian Spots)



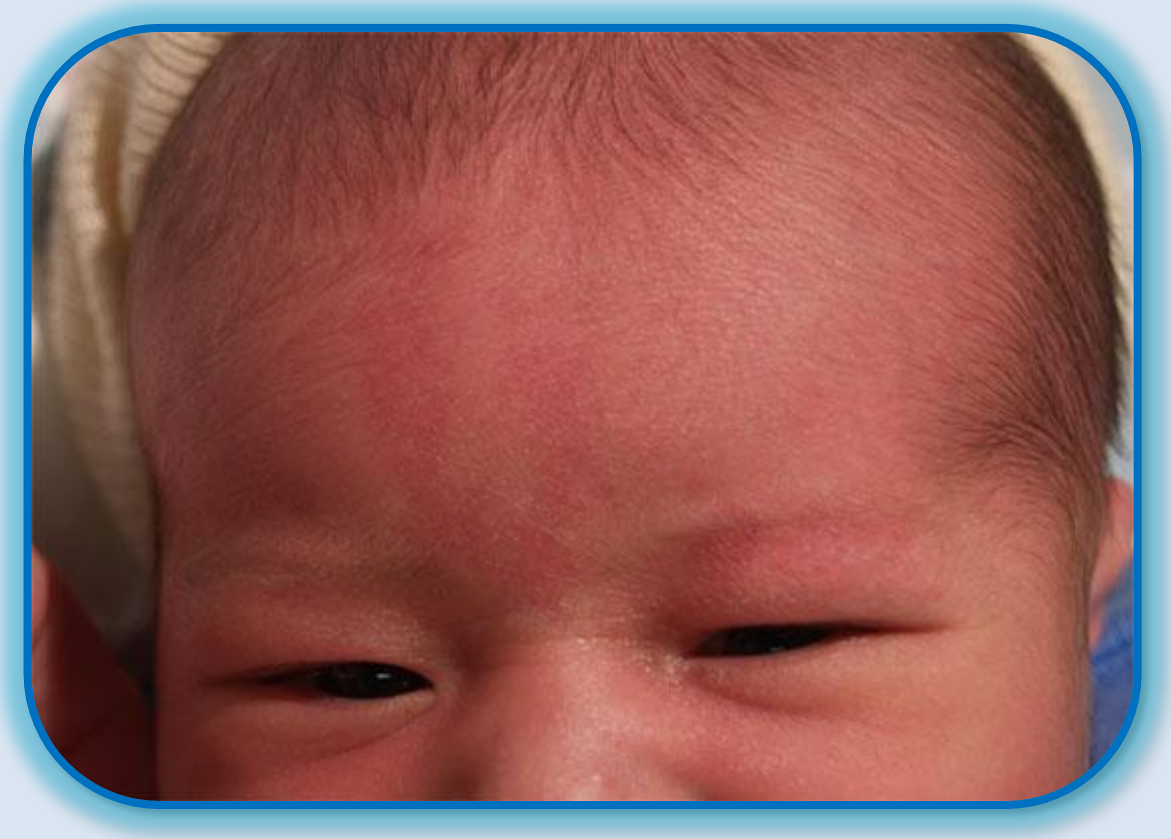
This is another **atypical** example. These slate grey patches are **typical in appearance, but unusual in location**, as this finding is almost always observed on the back or extremities.

Slate Grey Patch (Mongolian Spot)



This photograph was taken approximately 6 hours after birth. In this case, the infant was initially thought to have sustained a bruise from delivery because this hand presented in a position on top of the head. The homogenous appearance and discrete borders, though, are inconsistent with a fresh bruise.

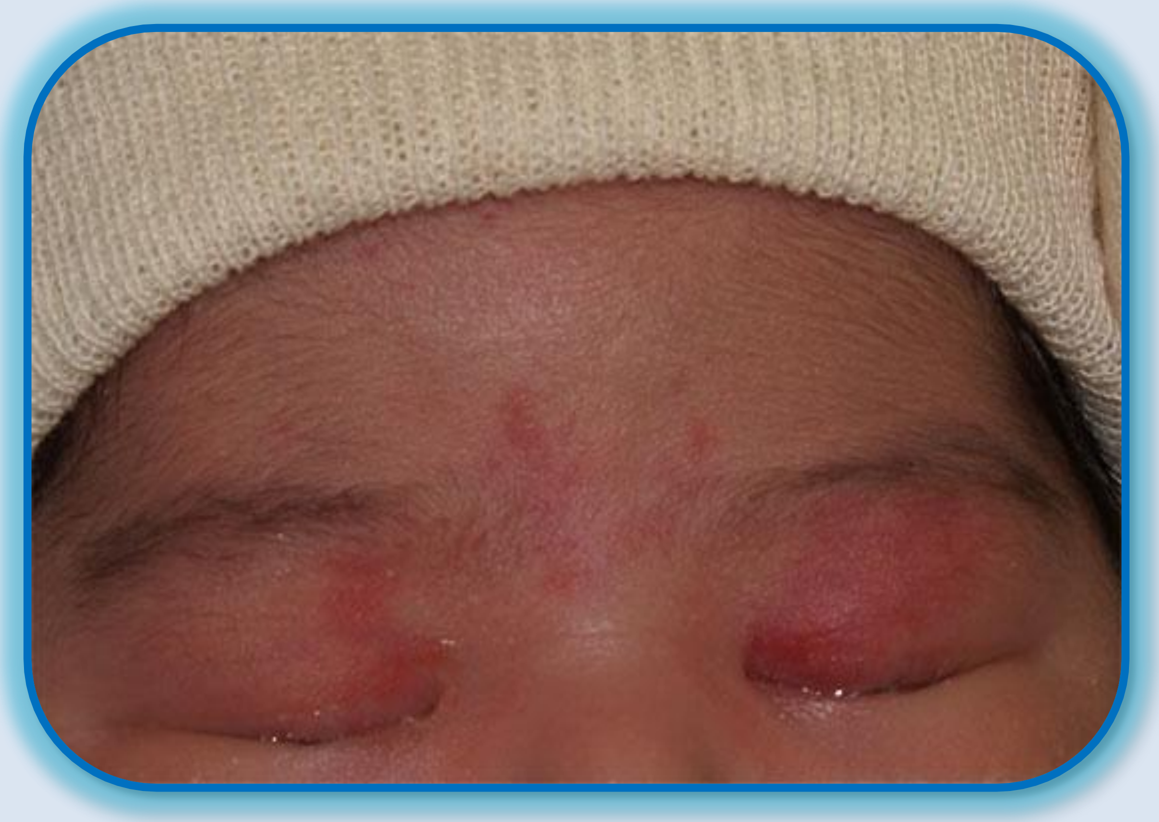
Salmon Patch



The **pink patches** in the middle of the forehead and over the left eye are salmon patches. Also known as nevus simplex or **"angel kisses"**, these are common **capillary malformations that are present at birth**.

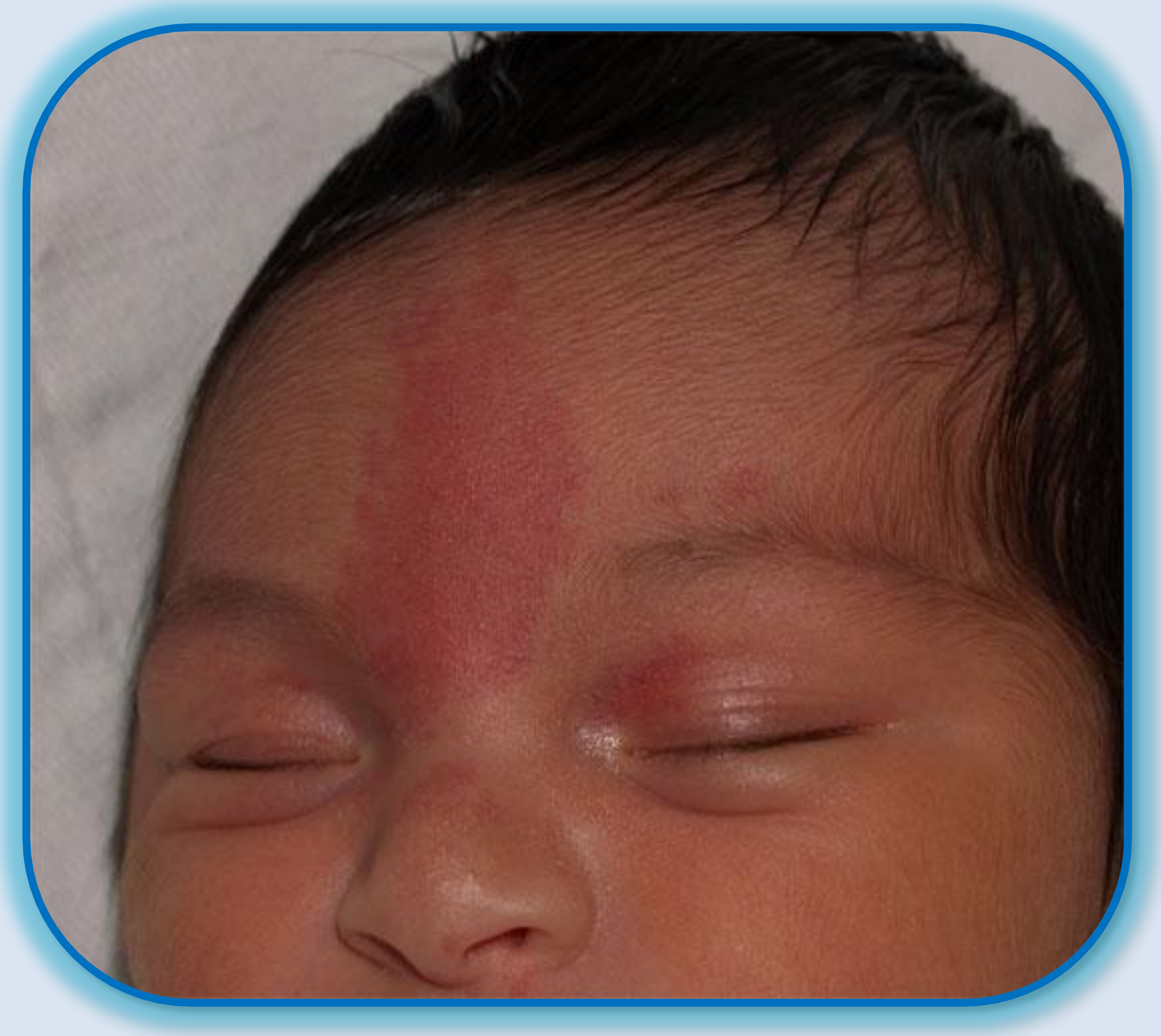
Eyelid spots generally **fade over** several months. Lesions on the glabella may take several years to resolve, and occasionally the outlines can be seen into adulthood, especially when the face is flushed.

Salmon Patch



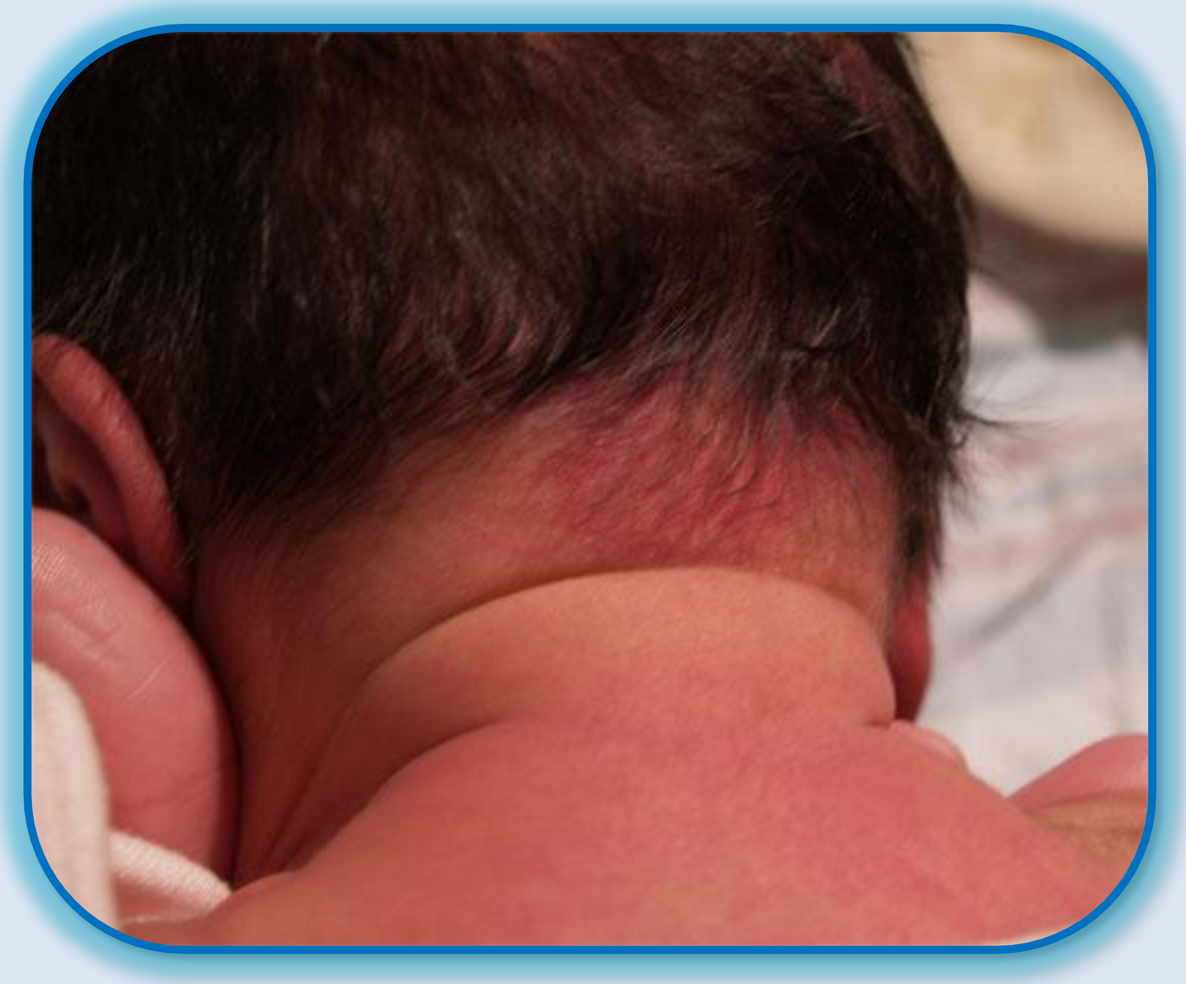
When lesions are present only on the eyelids, they are sometimes **mistaken for bruising**, but the examiner should realize that the eyelids are in a much protected position. Although the lids may be quite edematous, bruising in this location would be highly unusual, even in a baby with bruising elsewhere on the face.

Salmon Patch



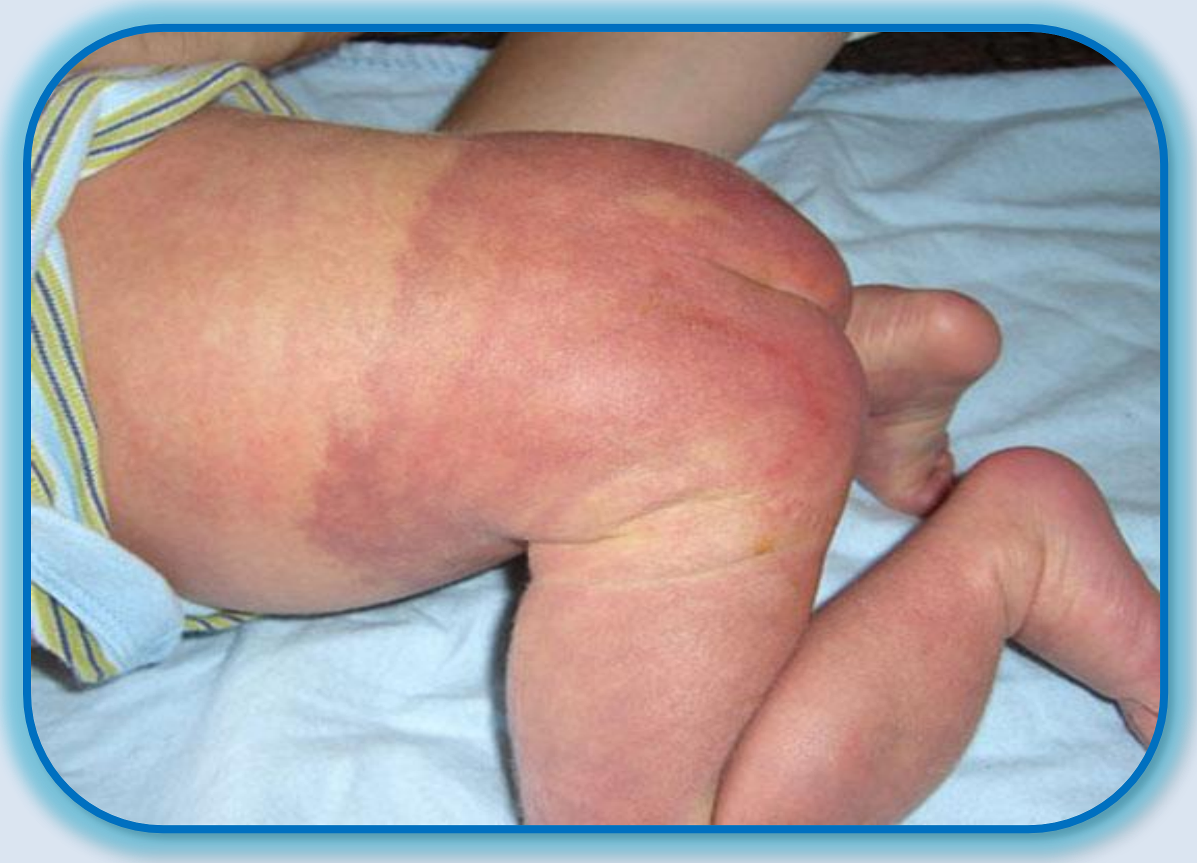
In this newborn, small spots can be seen over the eyelids and near the tip of the nose in addition to the large spot on the forehead.

"Stork Bite" Mark



Salmon patches may also be found on the nape of the neck in newborns. Nicknamed **"Stork Bite Marks"**, these lesions become less intense with time, but are frequently visible into adulthood.

Port Wine Stain



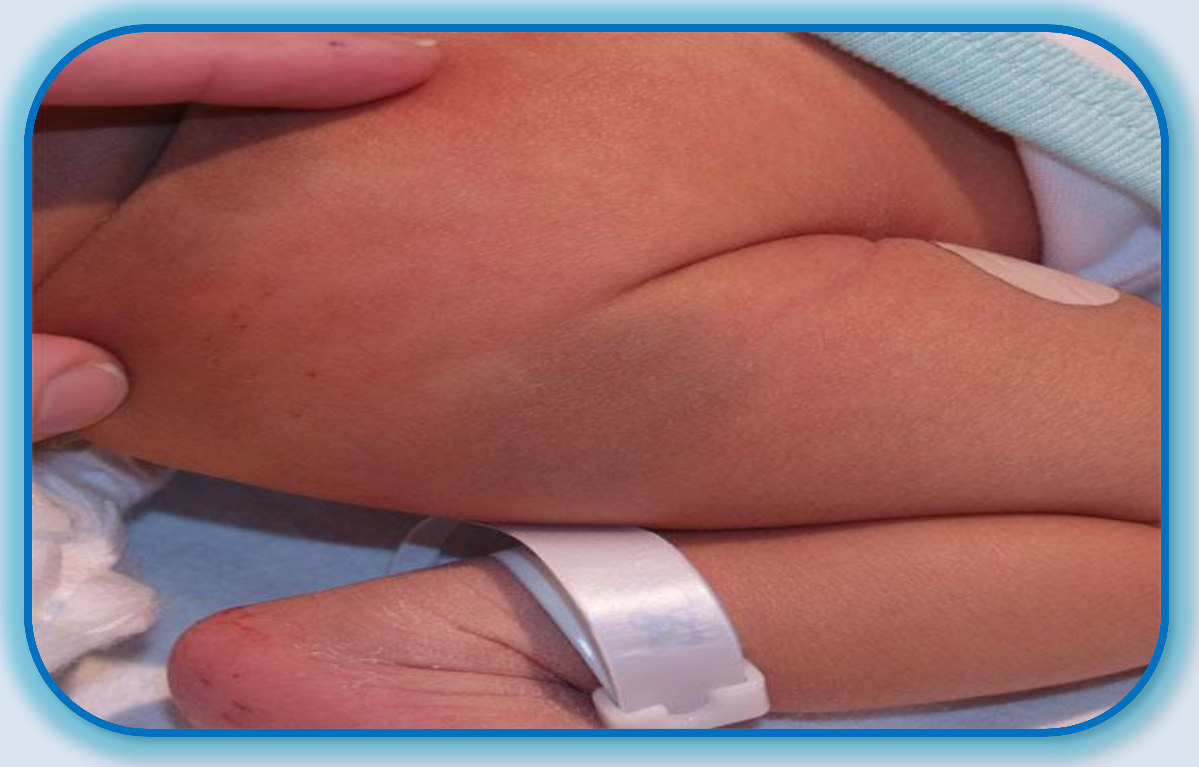
They are typically **more intense and purple-red in color than salmon patches**.

In some cases, as seen here, a port wine stain may affect a large surface area.

The discoloration is not, of itself, a problem, but it **may be a clue to an underlying condition**.

Port wine stains on the **face** may be associated with **Sturge-Weber syndrome**, and those on the **extremities** may be associated with **Klippel-Trenaunay-Weber syndrome**, in which overgrowth of an extremity may occur.

Hypopigmented Macule



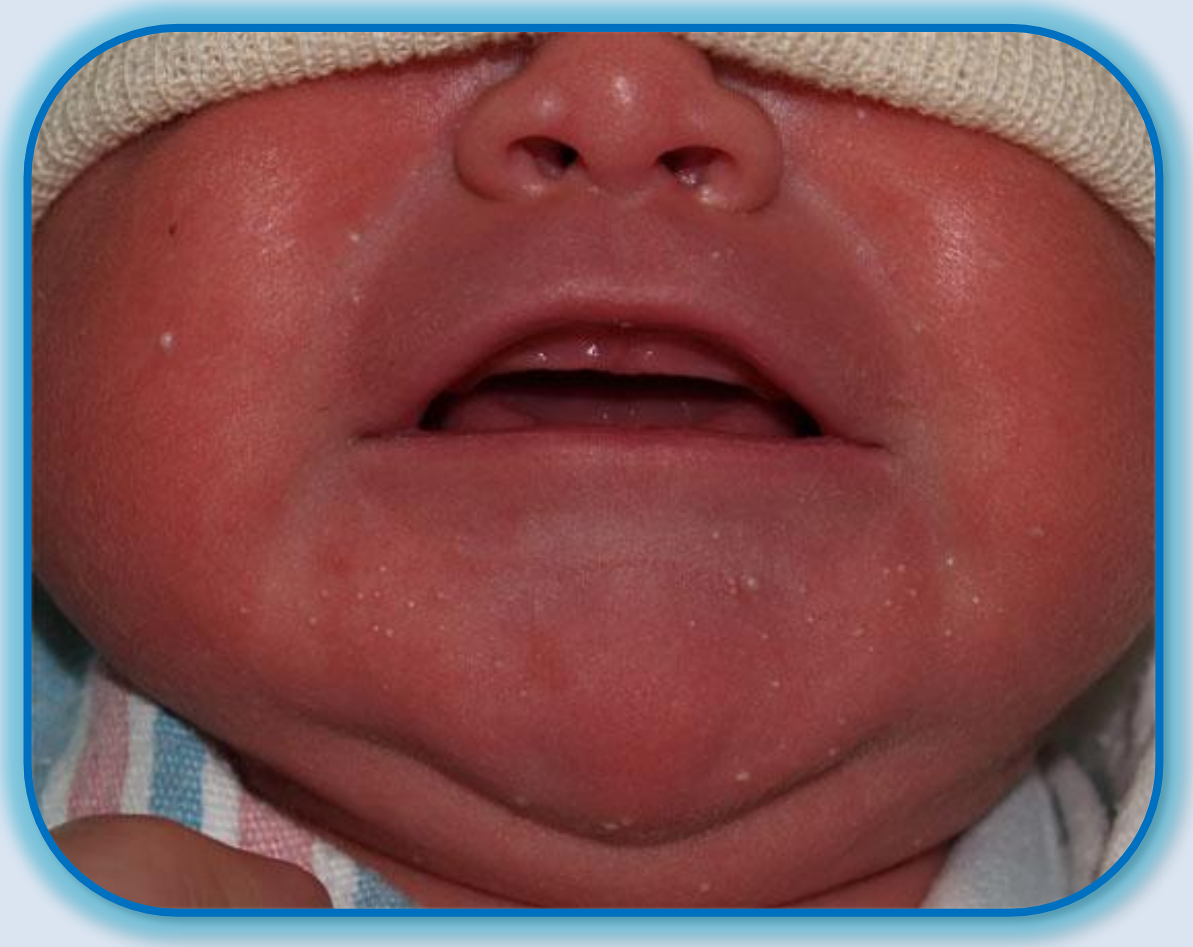
Hypopigmented macules are typically very **subtle, and benign**, findings in the newborn. In this patient, the macule partially overlaps the slate-grey patch.

It is usually transient, and caused by abnormal local vasoconstriction.

If it is important to differentiate vasoconstriction from true hypopigmentation, a **wood's lamp** can be used. If an abnormality of pigment exists, the lesion will appear bright under a wood's lamp, while areas of abnormal vasoconstriction will appear the same as the surrounding skin.

Ash leaf spots, associated with **tuberous sclerosis**, are rare in newborns; **usually they appear in children more than 5 years old**.

Milia

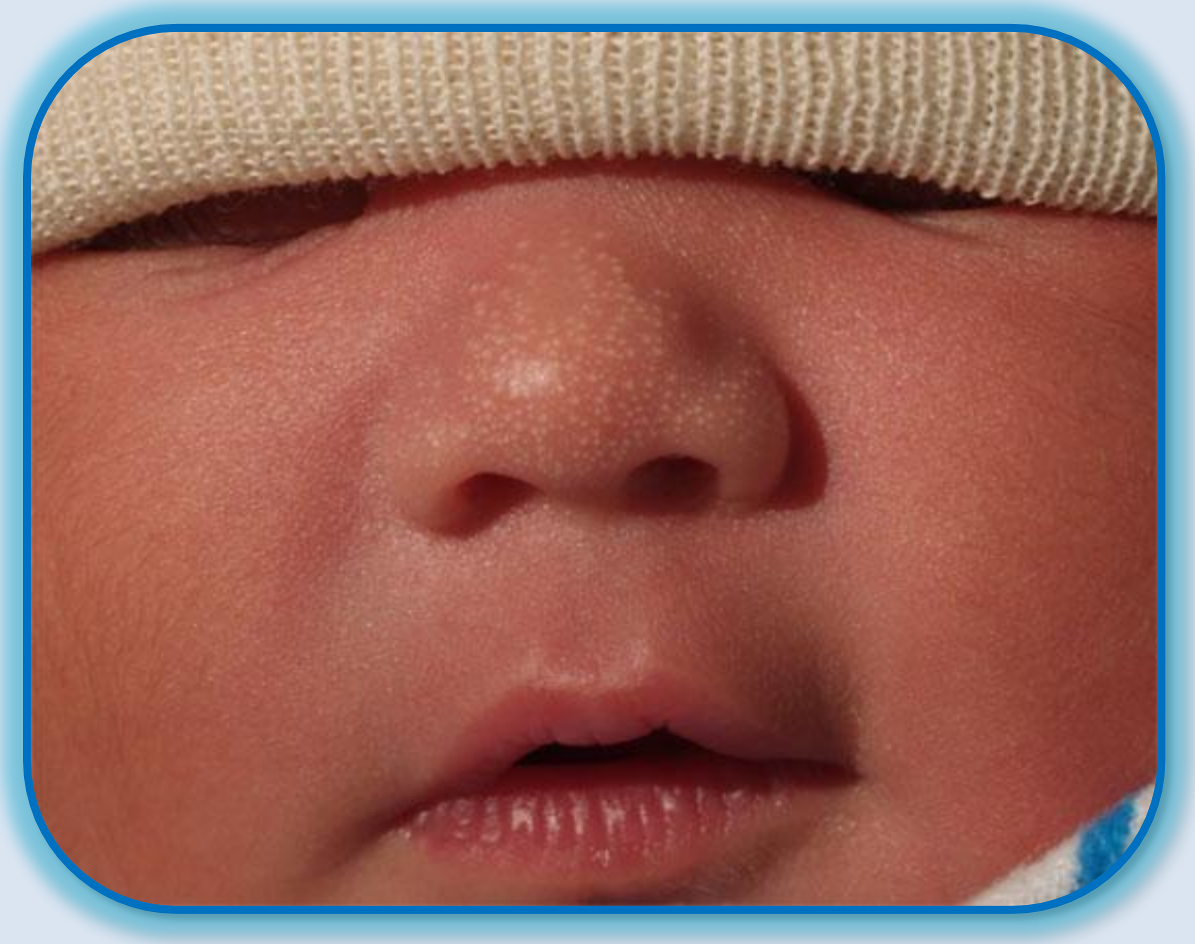


Milia are **keratin filled epithethial cysts** (white papules) which occur in up to **40% of newborns**.

Spontaneous exfoliation and resolution is expected within a few weeks.

Occasionally could be **mistaken for neonatal acne**, but milia are **present at birth** and have no inflammatory component. Acne, even though caused by maternal hormones, does not generally appear until *after* 2 weeks of age.

Sebaceous Hyperplasia

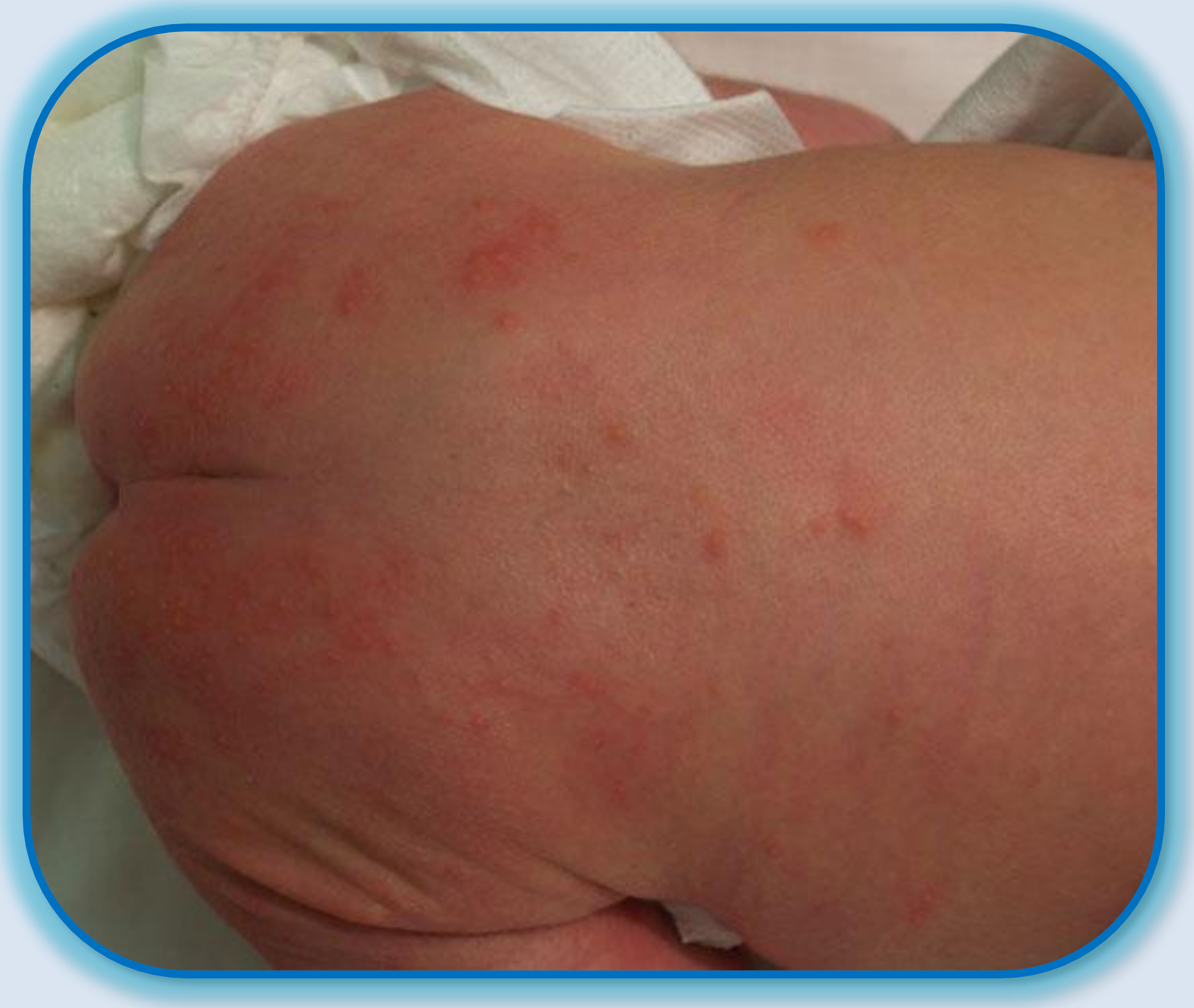


In contrast to milia, the raised lesions on the nose in this newborn are sebaceous hyperplasia. The lesions are **more yellow** than milia and are the result of **maternal androgen** exposure in utero.

Sometimes referred to as "the miniature puberty of the newborn", maternal hormone exposure may also cause vaginal withdrawal bleeding in infant girls and neonatal acne.

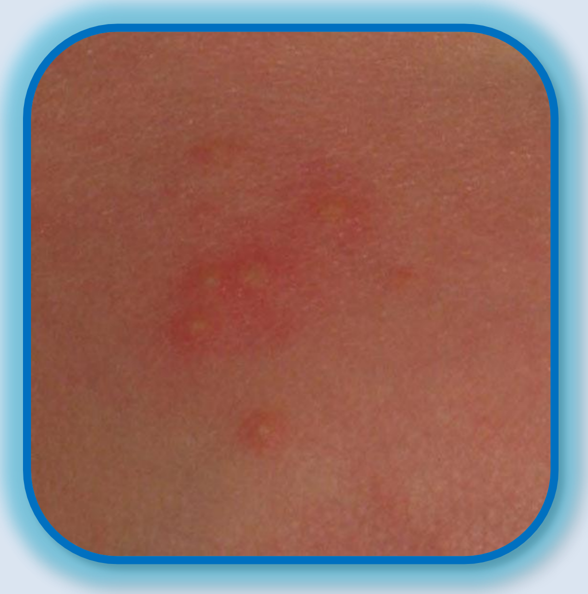
Sebaceous hyperplasia is a **benign** finding and **spontaneously resolves** with time. **No evaluation is needed**.

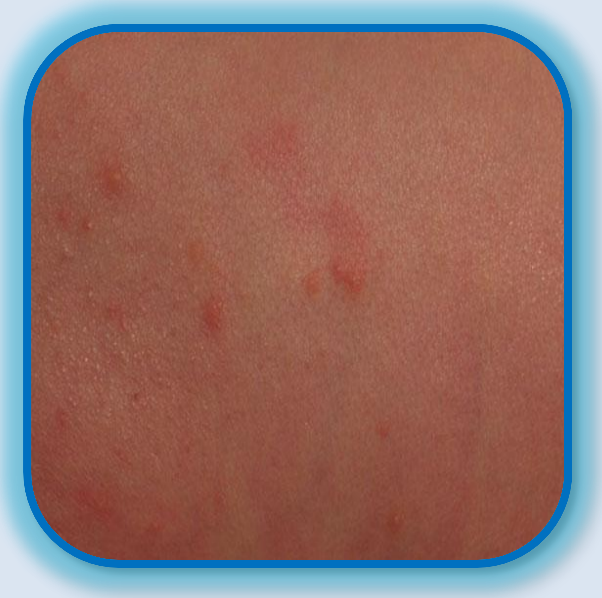
Erythema Toxicum



This is the "rash" most commonly observed in the neonates. Lesions generally **start on day 1 or 2** and increase in number over the next several days, followed by **spontaneous resolution** in about a week. Even newborns that have hundreds of spots are not symptomatic and **need no further evaluation**.

Erythema Toxicum



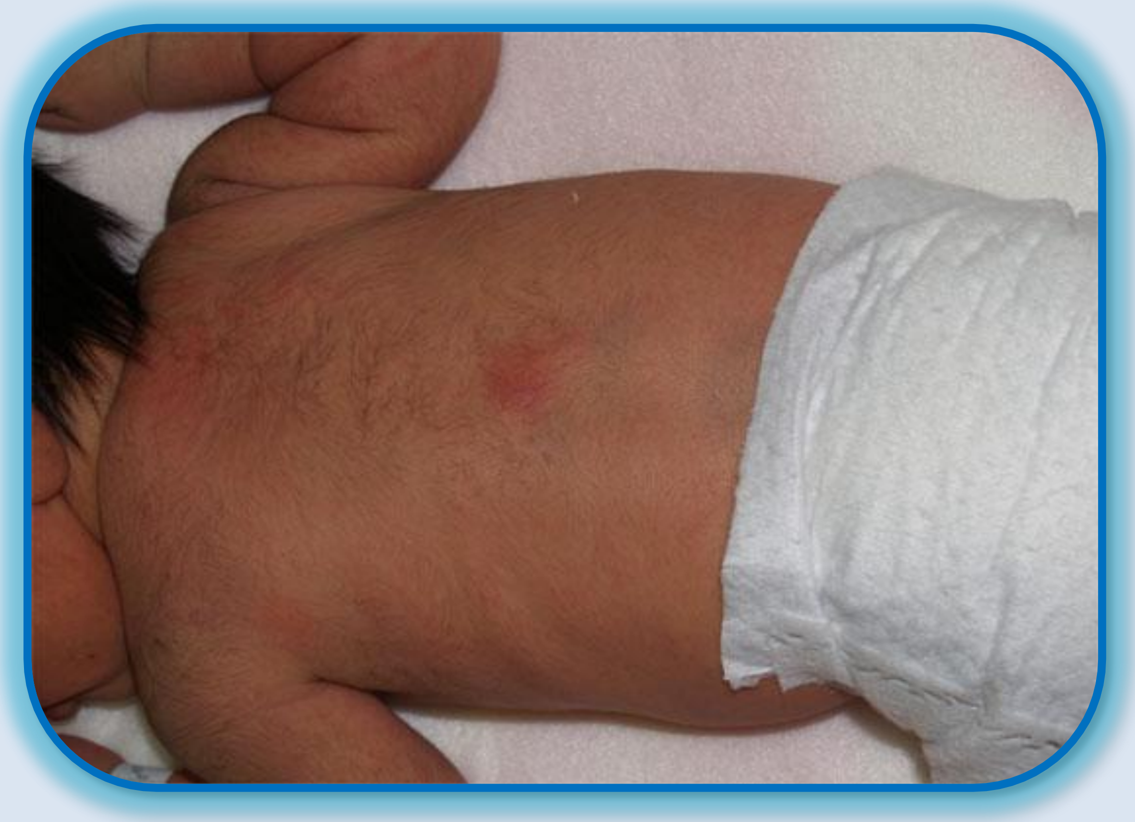


Another examples of erythema toxicum rash.

A **central, yellowish papule is surrounded by a halo of erythema**.

More than **half of all newborns** will have this to some degree.

Subcutaneous Fat Necrosis



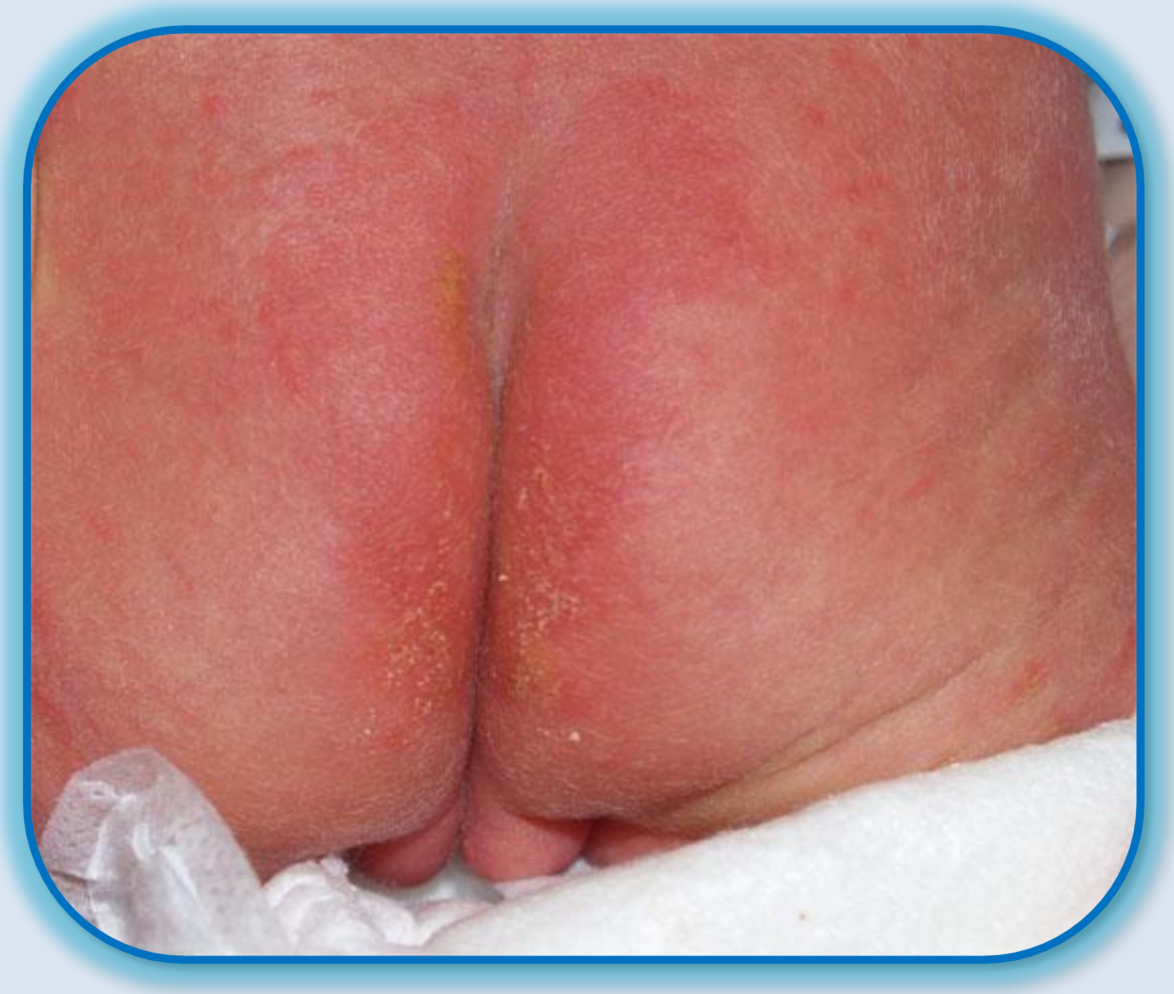
This **red** lesion is subcutaneous fat necrosis. **On palpation**, there is a **firm nodule** in the subcutaneous tissue under the area of redness that is **freely mobile** with respect to the bony structures underneath it.

Subcutaneous fat necrosis is **more common in** infants who have had difficult deliveries, cold stress, or perinatal asphyxia.

Lesions are typically **asymptomatic** and **resolve spontaneously** within several weeks, usually without scarring or atrophy.

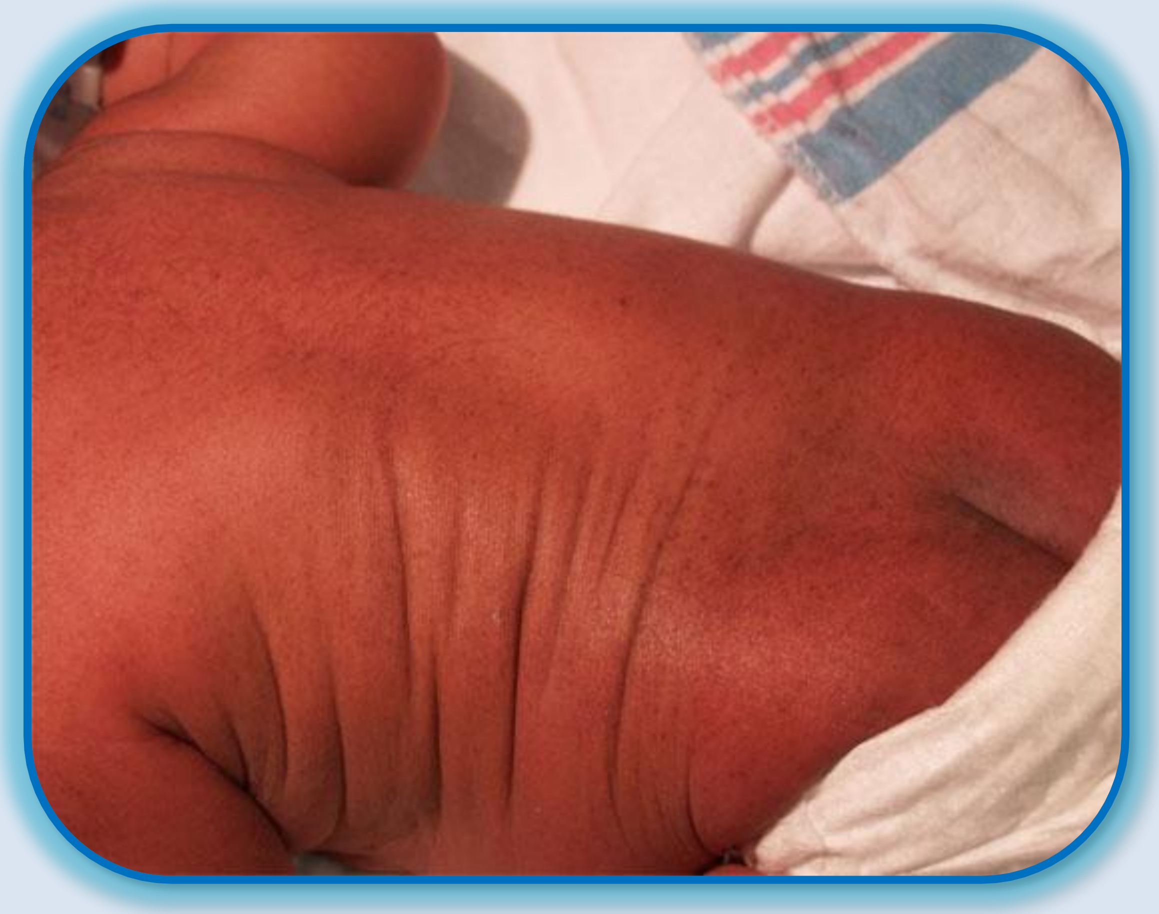
Infants with extensive lesions or with renal disease should have calcium levels followed once or twice weekly. **Hypercalcemia** associated with subcutaneous fat necrosis is rare, but is a potentially lethal complication.

Skin Irritation



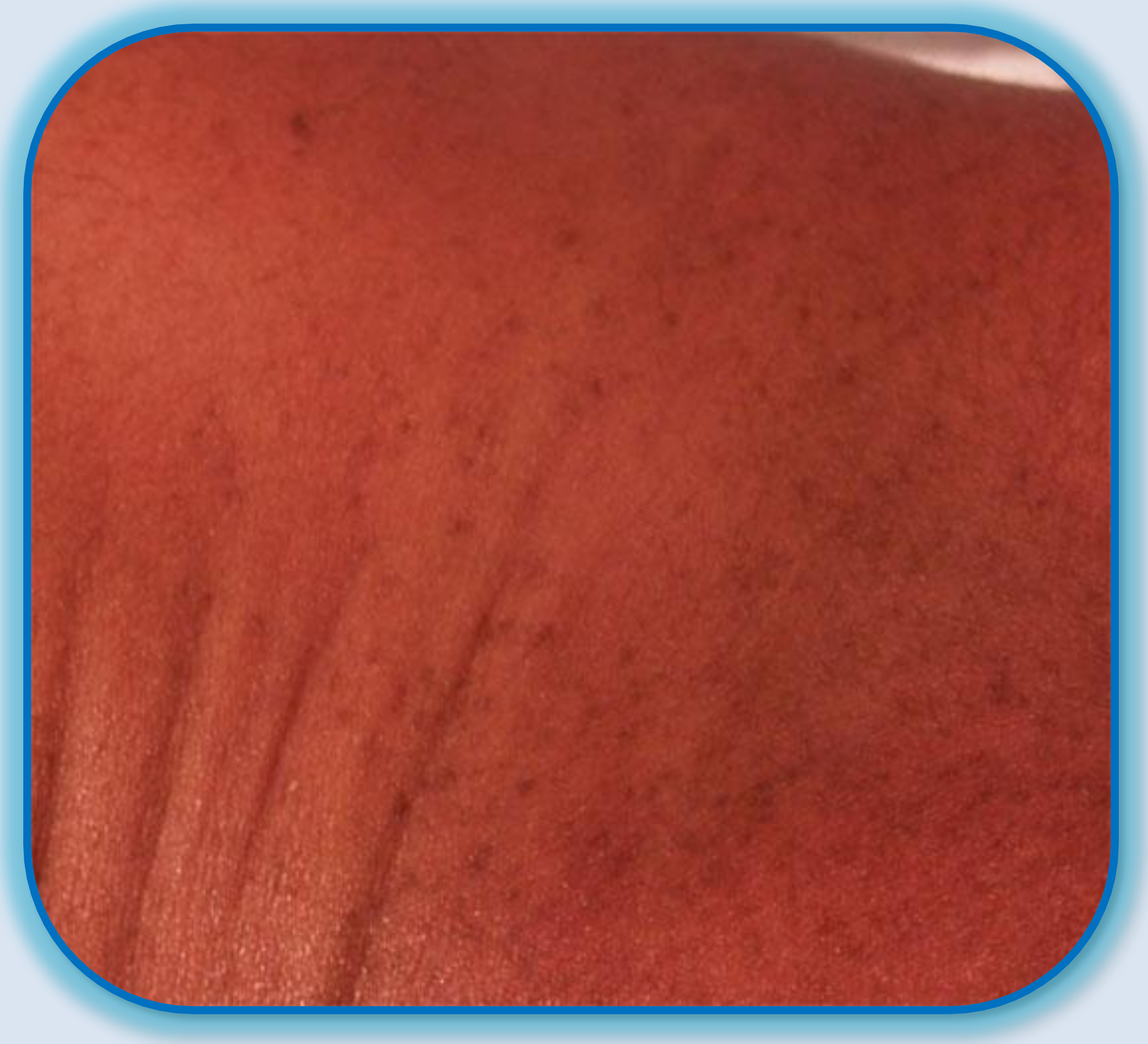
These raised yellow lesions are the result of irritated skin. Some newborns will have particularly sensitive skin, and may develop a "rash" of this type even in the absence of diarrhea or other known offending agents. Symptomatic care and good diaper hygiene (with thorough drying before the diaper is replaced) is recommended.

Transient Neonatal Pustular Melanosis



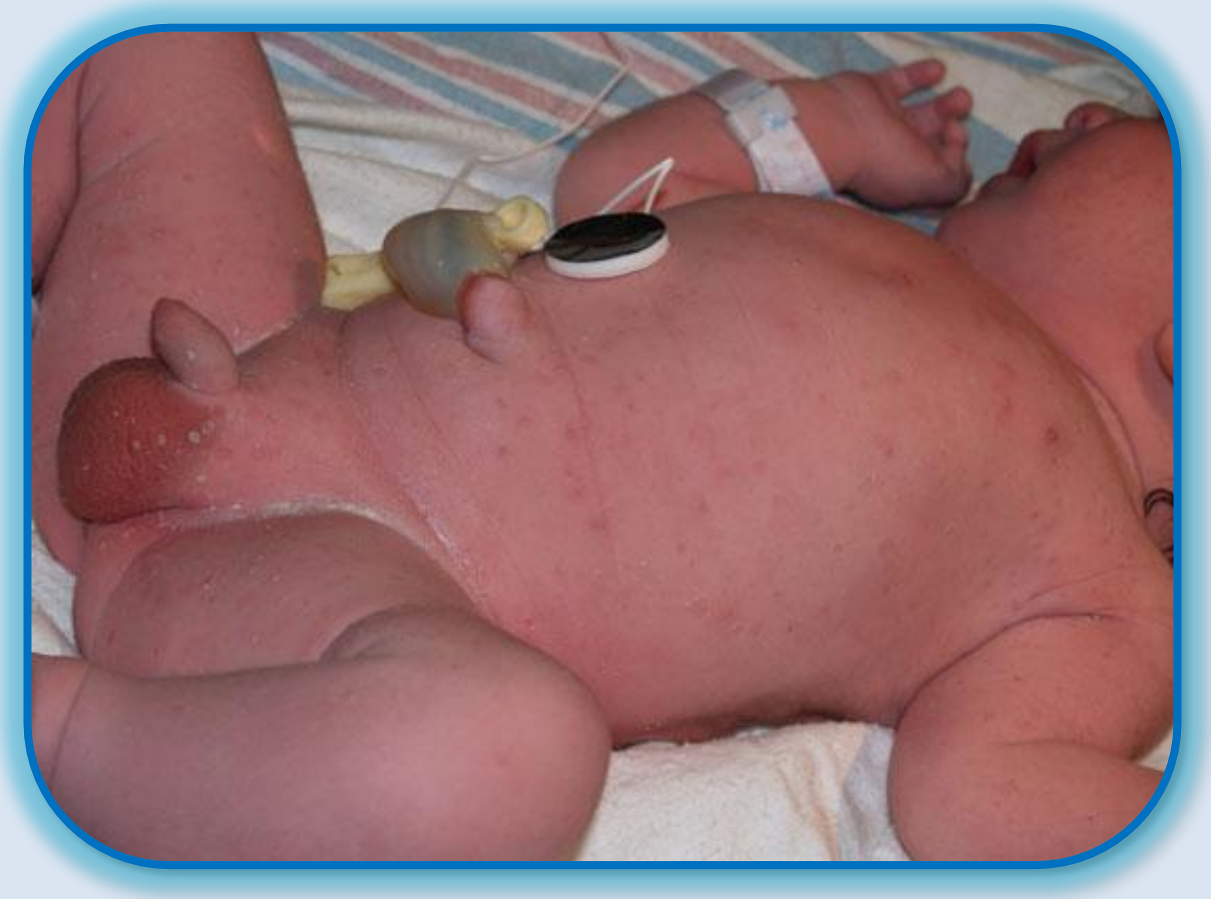
This infant was born with only the **hyperpigmented macules** present. Although the **etiology is unknown**, it has been observed that African Americans infants are more frequently affected with this condition, occurring in **up to 4%. Spontaneous resolution** is expected.

Transient Neonatal Pustular Melanosis



Here is a close-up of the lesions present in the previous photo.

Transient Neonatal Pustular Melanosis

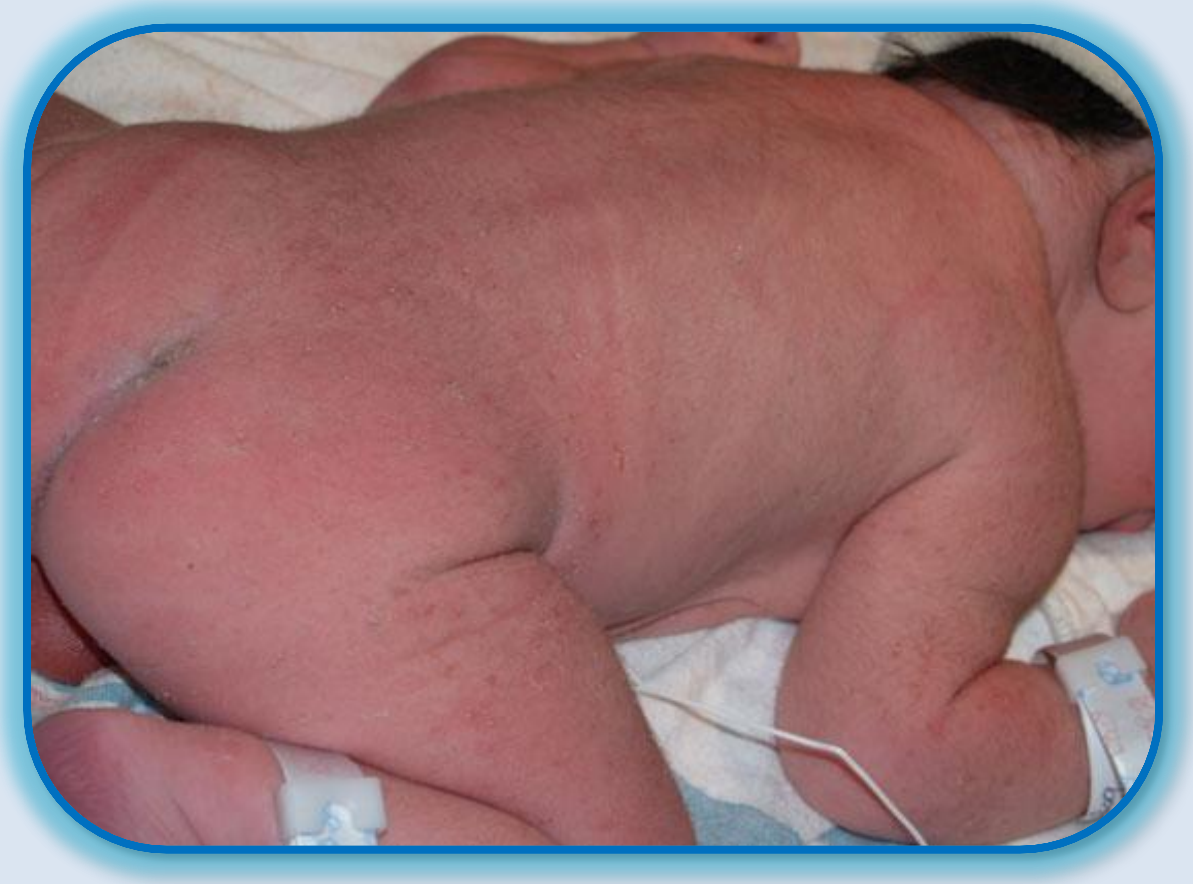


All the lesions seen here are consistent with this diagnosis. The hallmark of this rash is the **hyperpigmented spots** that remain (seen here on the chest) after the **fragile pustules** (seen on the scrotum and thigh) have resolved.

Because the rash starts in utero, lesions may be in any stage **at birth**.

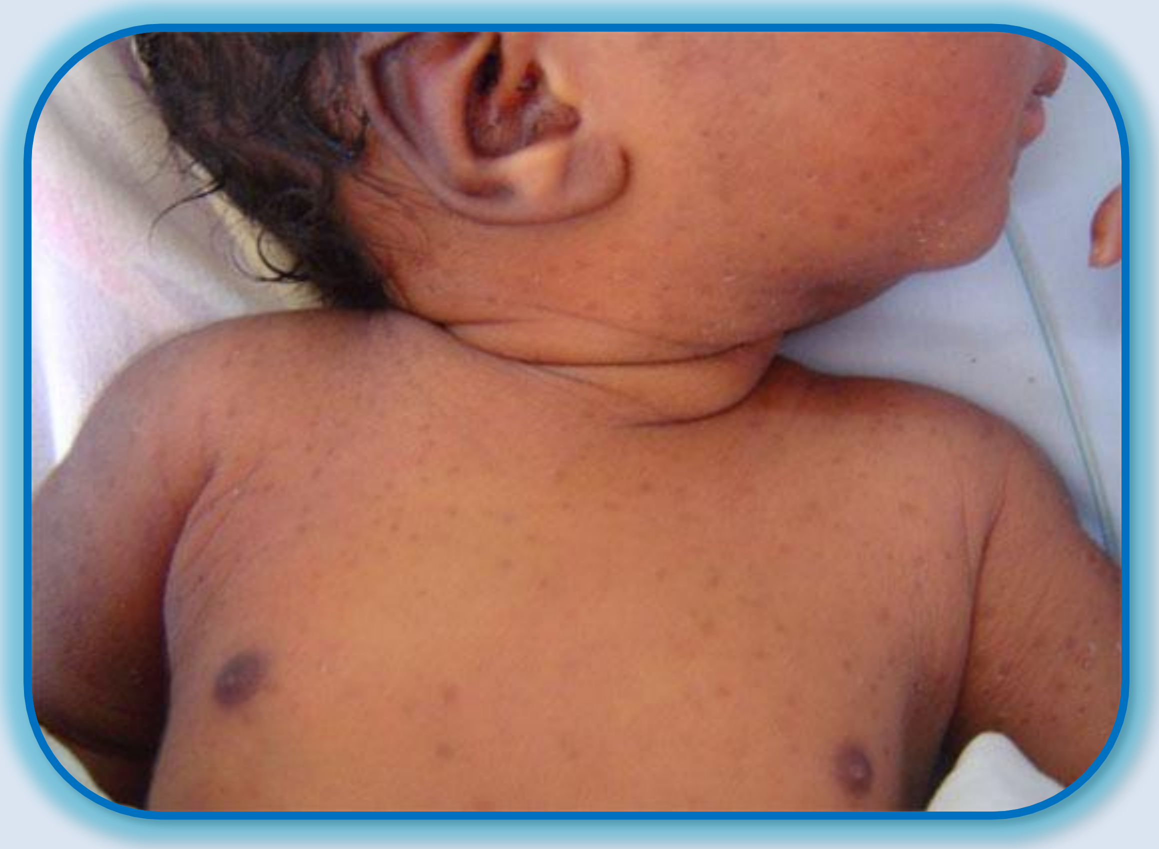
Despite the anxiety-provoking appearance of a newborn covered in pustules in the delivery room, **no evaluation is needed** when non-inflammatory pustules occur in combination with hyperpigmented macules in an otherwise well infant.

Transient Neonatal Pustular Melanosis



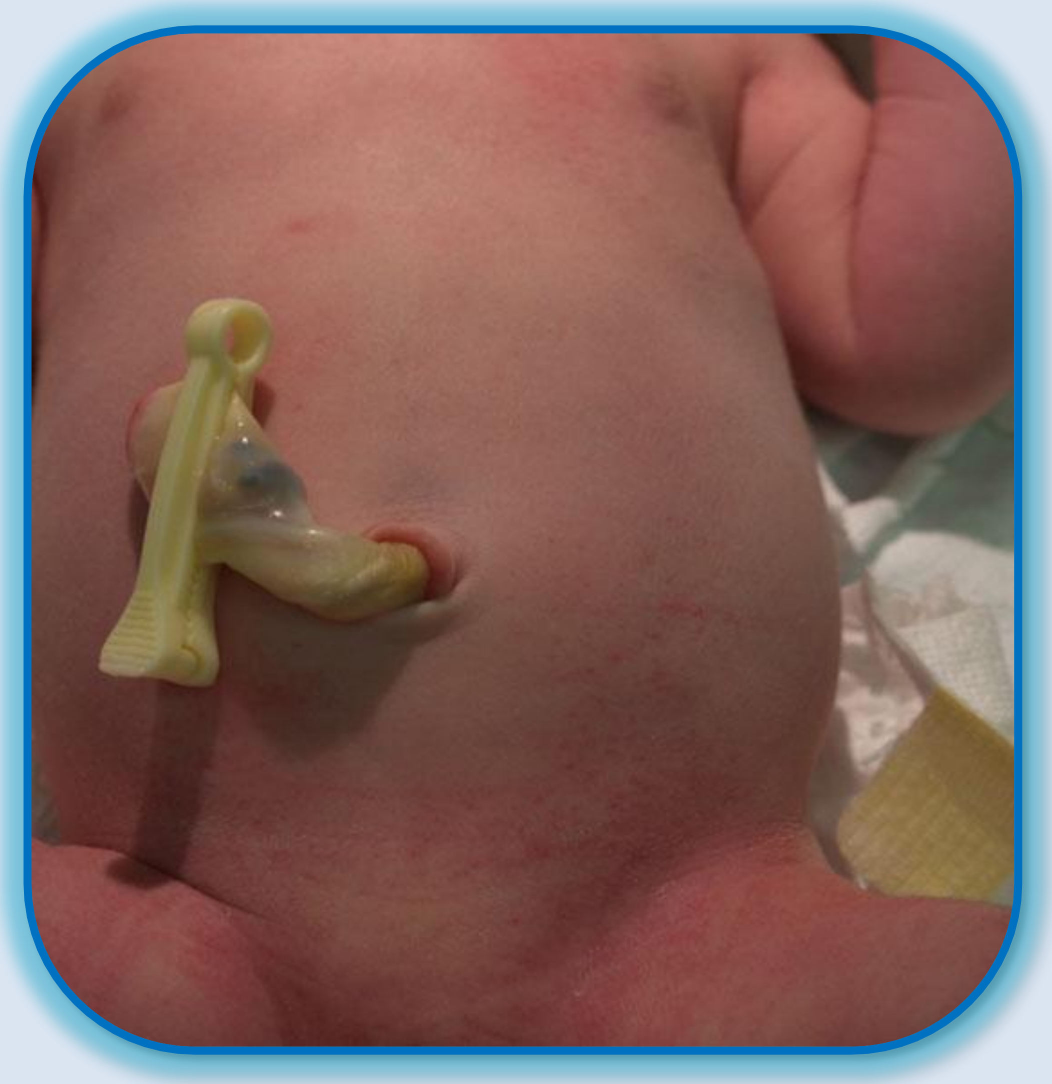
The back of the infant in the previous photo. Fewer pustules are noted here, but there are more hyperpigmented macules. These are expected to fade over several months. **The pustules are fragile and last only a day or two**.

Transient Neonatal Pustular Melanosis



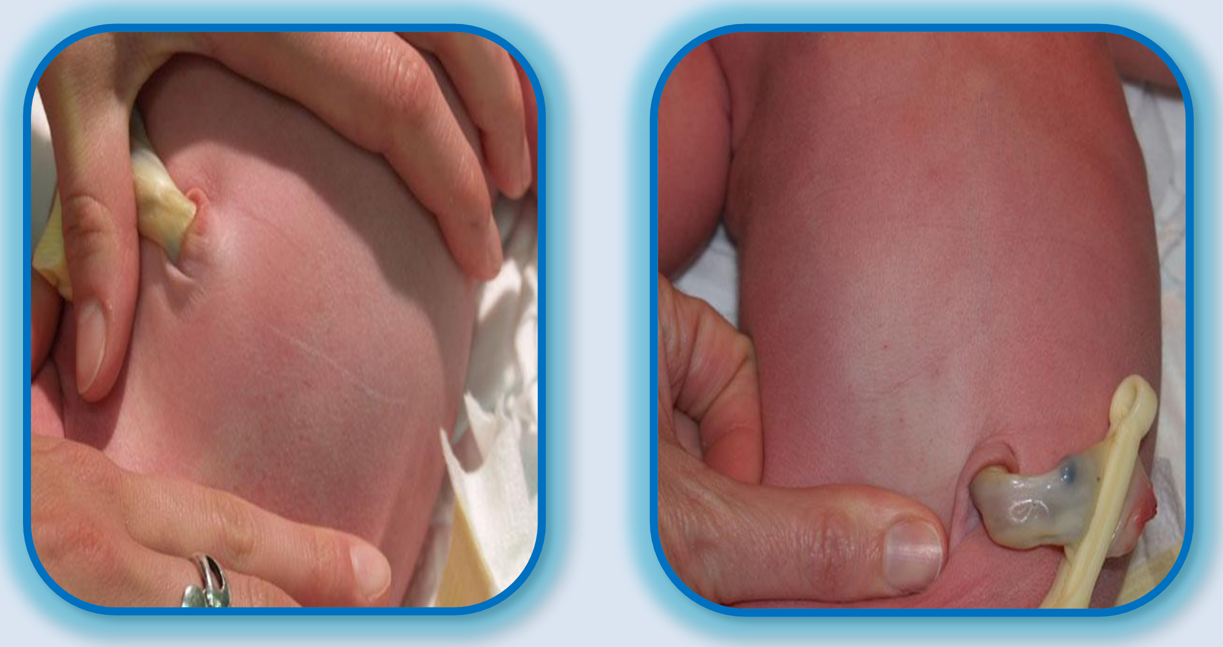
This is another infant with the **hyperpigmented macules** typical of neonatal pustulare melanosis. In this photo, the "collarets of **scale**" that often surrounds the individual lesions can be appreciated (at the neck and the left axilla).

Petechiae



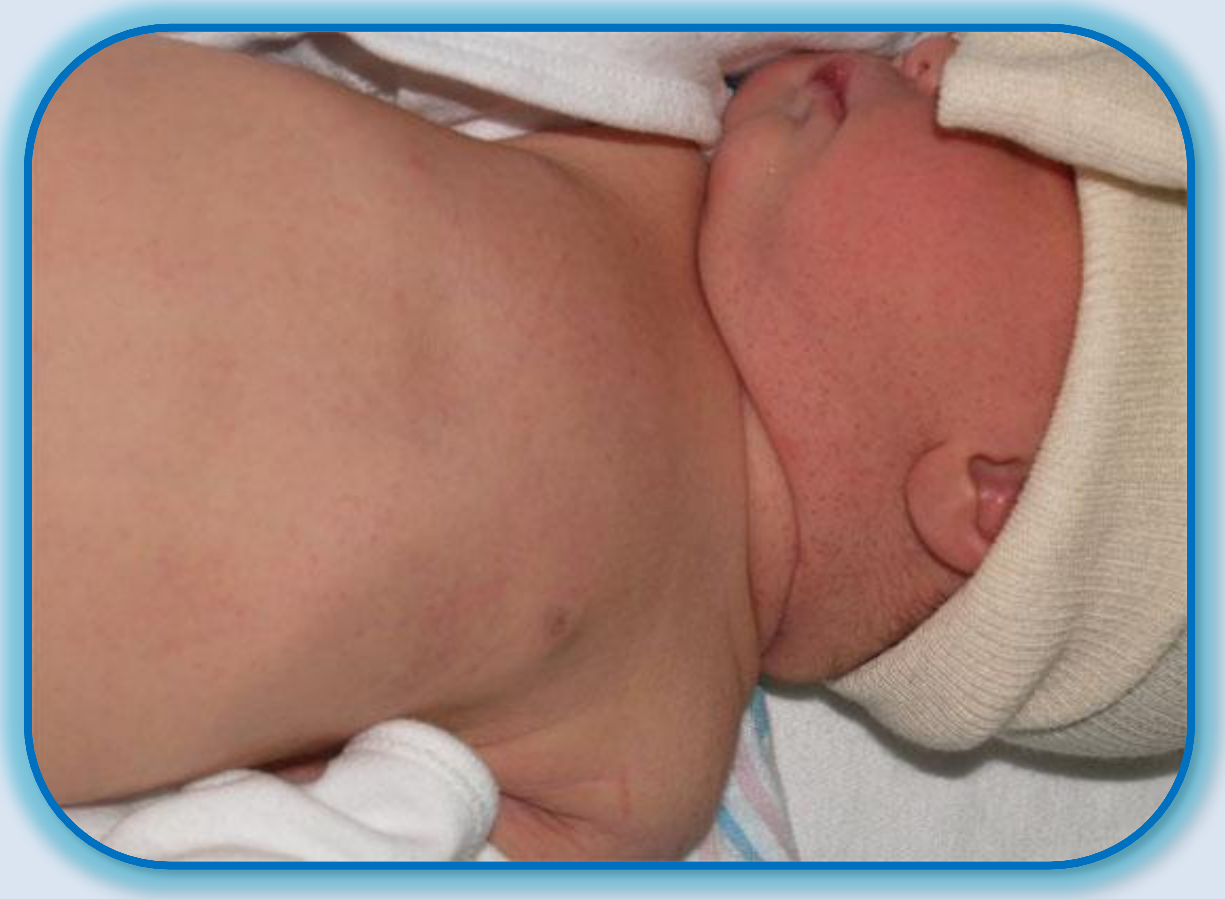
While petechiae may be due to pressure during birth, widespread petechiae deserve some evaluation; a CBC and platelet count in this infant was normal.

Petechiae



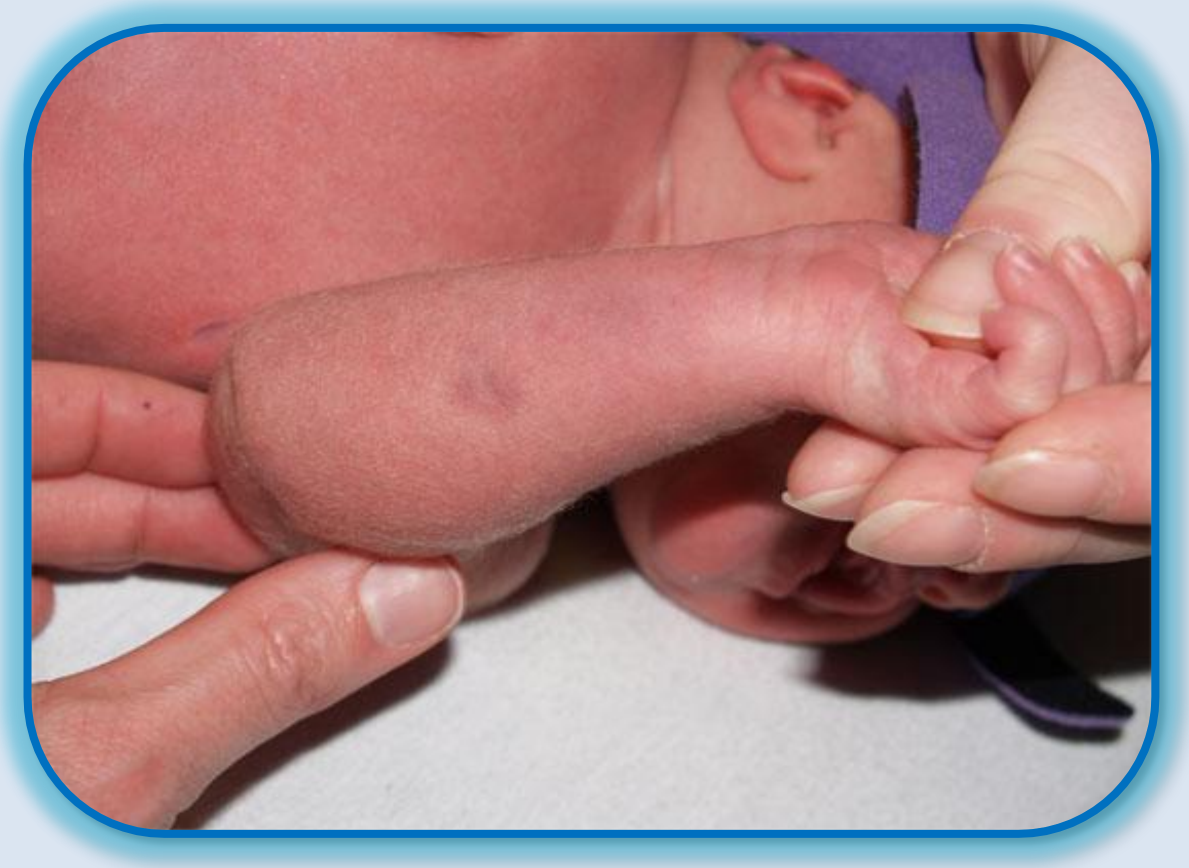
Blanching the abdomen reveals more petechiae than were appreciated on casual examination.

Petechiae



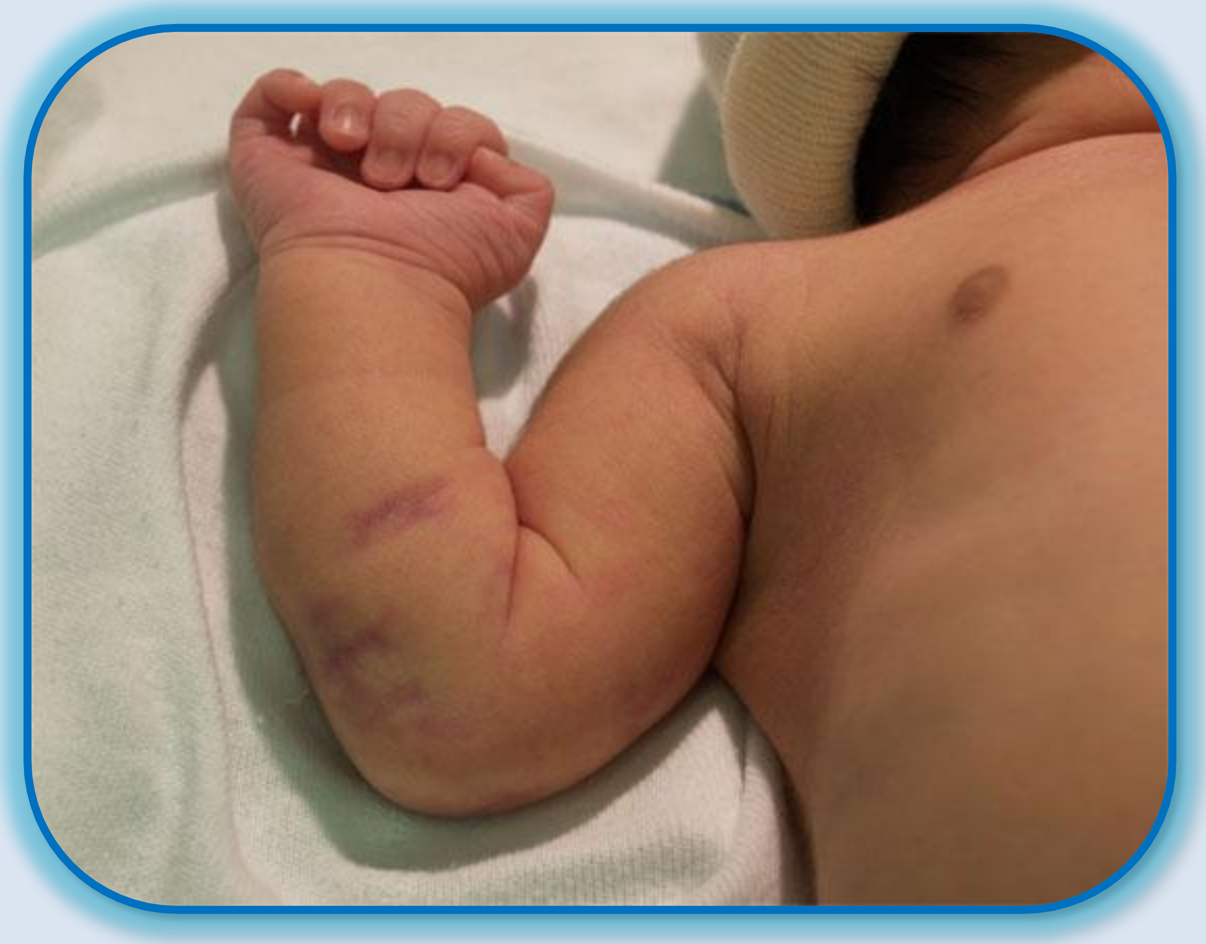
Another infant has petechiae primarily around the chin, neck, and upper chest. Given the relatively localized area affected in a newborn born vertex, no evaluation is needed.

Bruising



This infant had a somewhat difficult delivery, and as a result, sustained bruises on the head and the left arm. This picture was taken on the third day of life. By this time, the bruises were significantly improved from the appearance at birth.

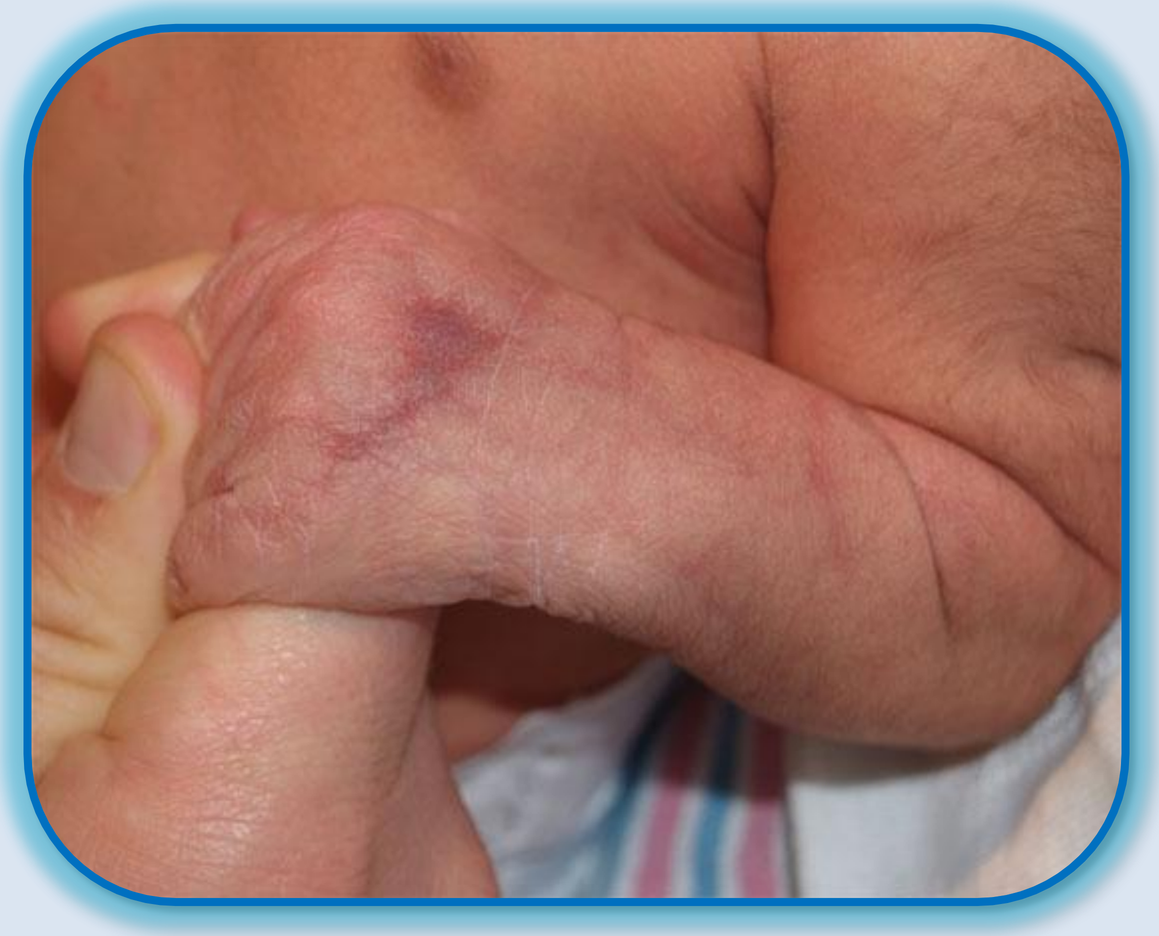
Cutis Marmorata Telangiectasia Congenita



On the initial physical examination, this infant was thought to have sustained bruising of the right arm during delivery. On closer inspection, however, the discolored areas are also **depressed**, suggesting some underlying atrophy of the skin. This is cutis marmorata tealngiectasia congenita, a **rare congenital vascular malformation**. The presentation seen here with **one limb affected** is most common.

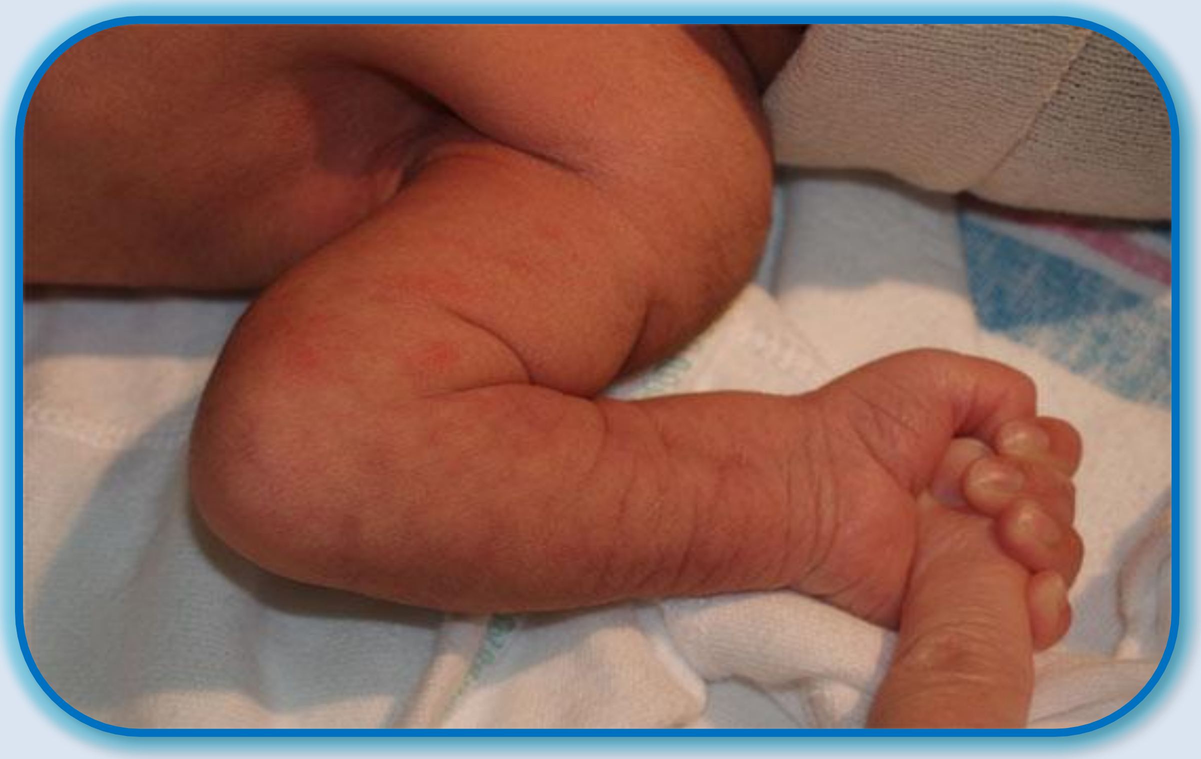
Associated defects may occur in up to **50%** of affected patients, but the cutaneous lesions tend to improve with time.

Cutis Marmorata Telangiectasia Congenita



In another patient, this dark purple lesion was noted on initial exam. **Port wine stain and bruising were considered in the differential diagnosis**, but the **angulated shape** made these possibilities less likely. In addition, there is a suggestion of dark **erythema streaking** from the lesion across the wrist.

Cutis Marmorata Telangiectasia Congenita



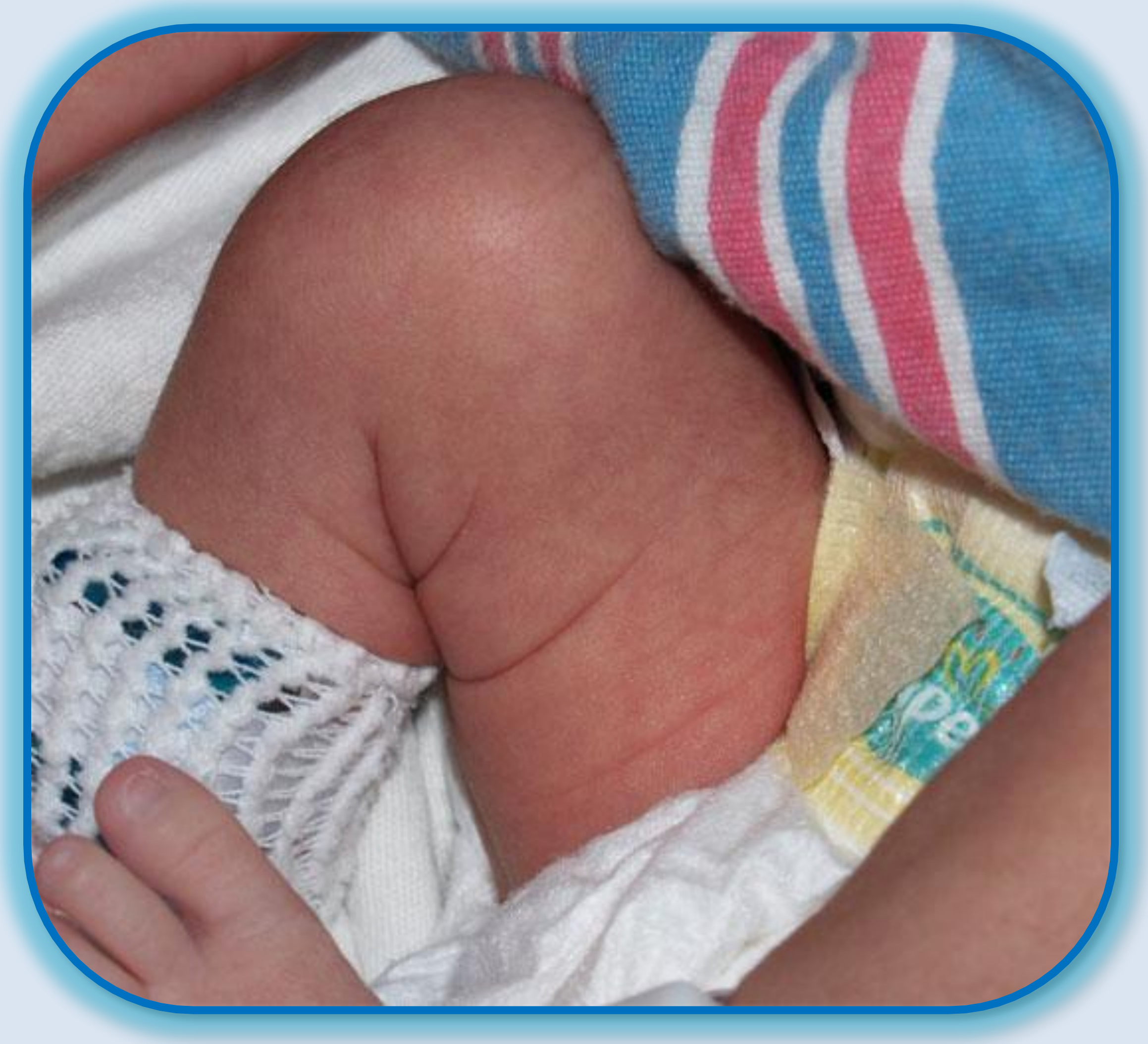
When the underside of the forearm was examined, mottled streaks of erythema were noted.

Although mottling occurs commonly in newborns exposed to cool temperatures, it is transient (disappears with rewarming) and more generalized than this.

Compare the mottled appearance of the forearm to the normal appearance of the upper arm to appreciate the difference.

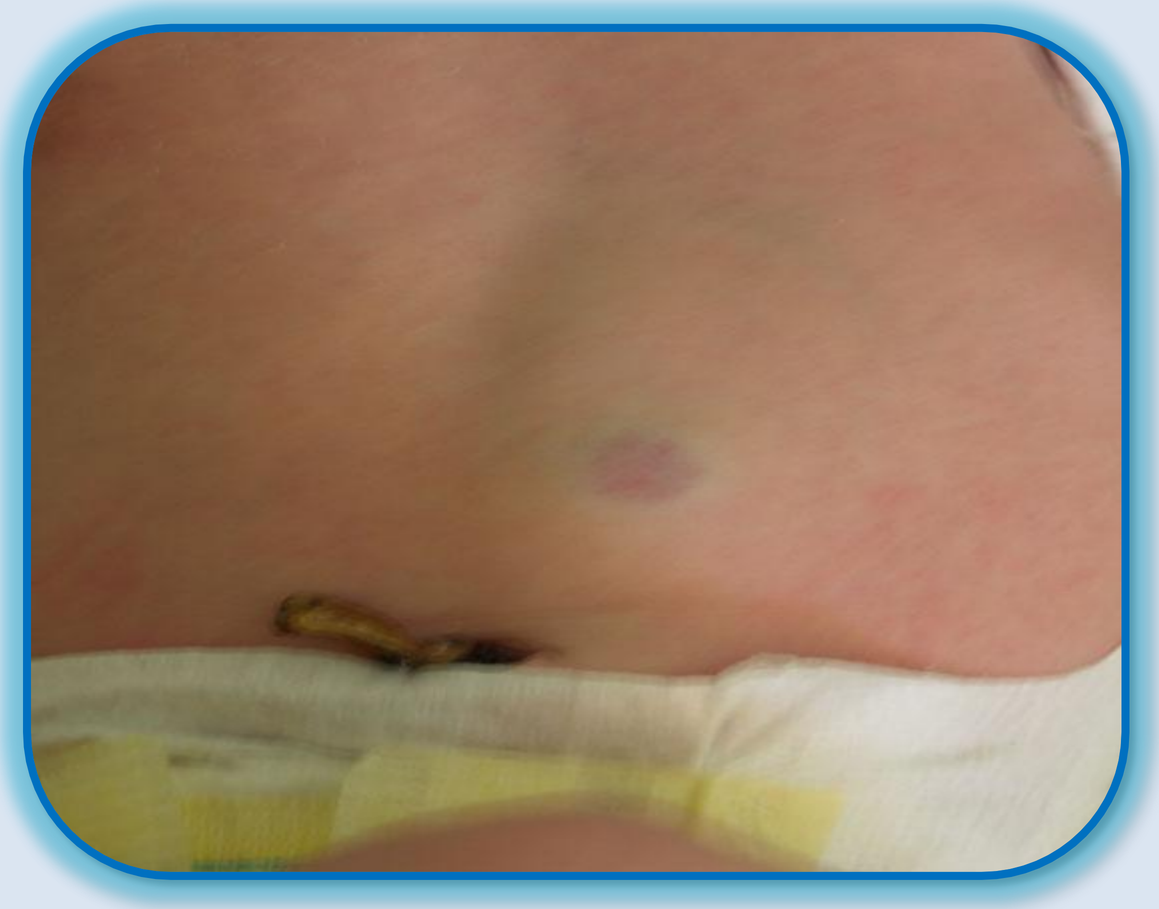
Cutis marmorata is the term used for mottling of the skin; in this case, the mottling is of the congenital, telangiectatic variety. Again, the skin lesions are expected to improve with time, but lesions should be followed for possible ulceration.

Mottling (Cutis Marmorata)



The **lacy erythema** present on the thigh of this newborn is mottling. Not to be confused with cutis marmorata telangiectasia congenita, cutis marmorata (mottling) is a **transient and common** finding in newborns. It is particular visible when the infant is cold and **disappears with warming.**

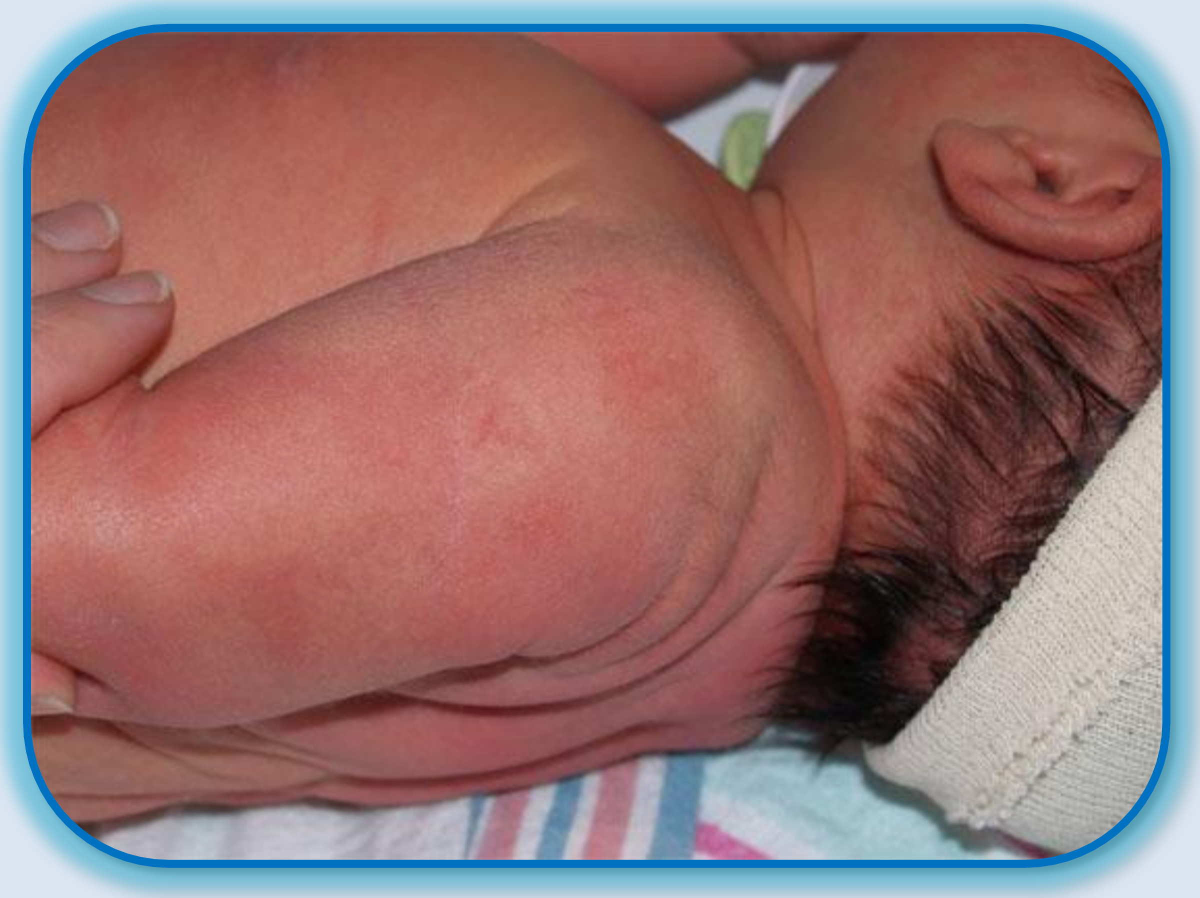
Early Hemangioma



In the newborn nursery, the raised, red appearance of a strawberry hemangioma is not usually seen. Instead, the precursors of these lesions are found.

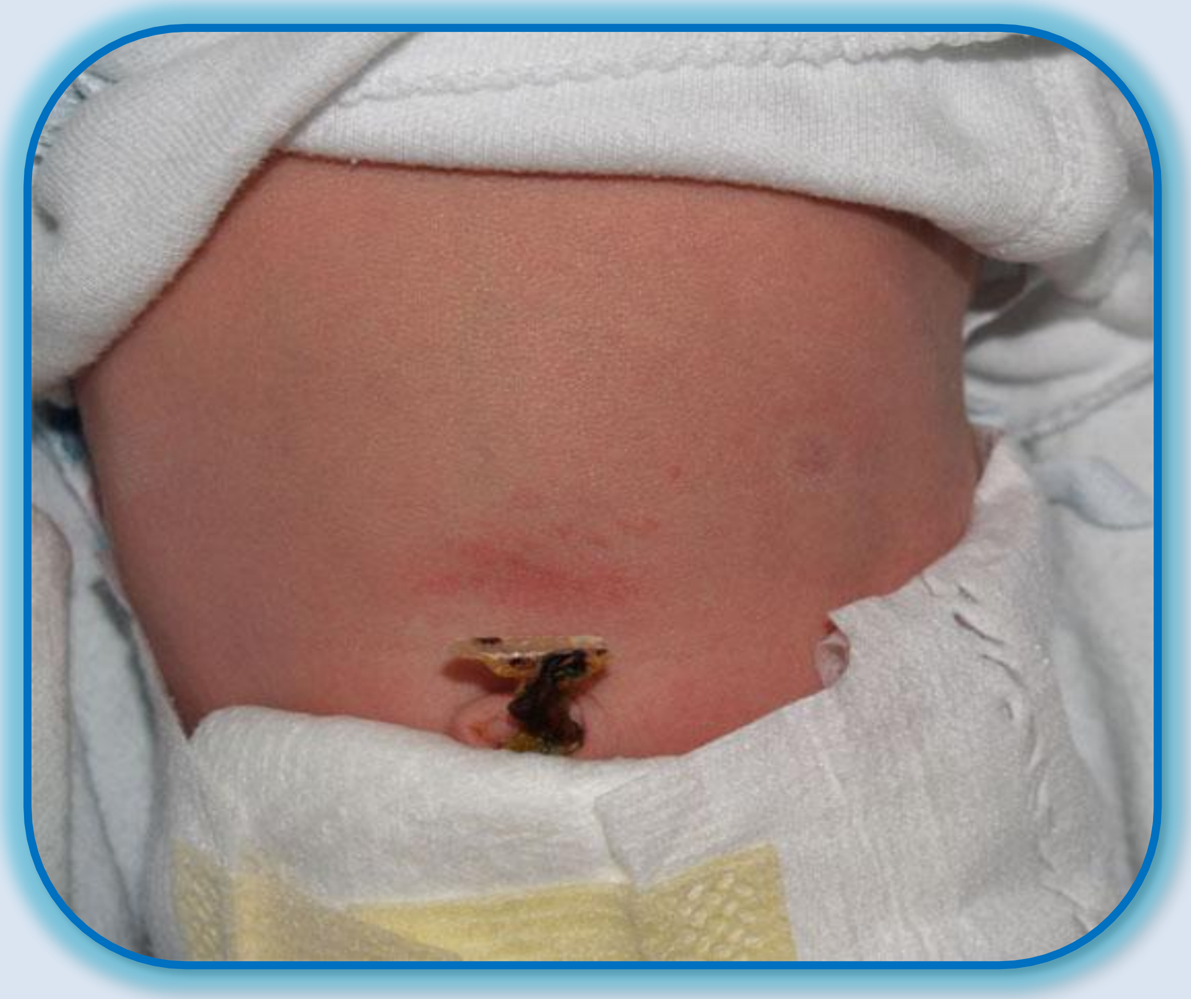
Although this photo is somewhat blurry, the lesion at this stage contains a central area of telangiectasia surrounded by a halo of pallor.

Early Hemangioma



This lesion is much more subtle and is completely flat, but the circular area of pallor with central vascular markings can still be seen on the upper arm of this newborn.

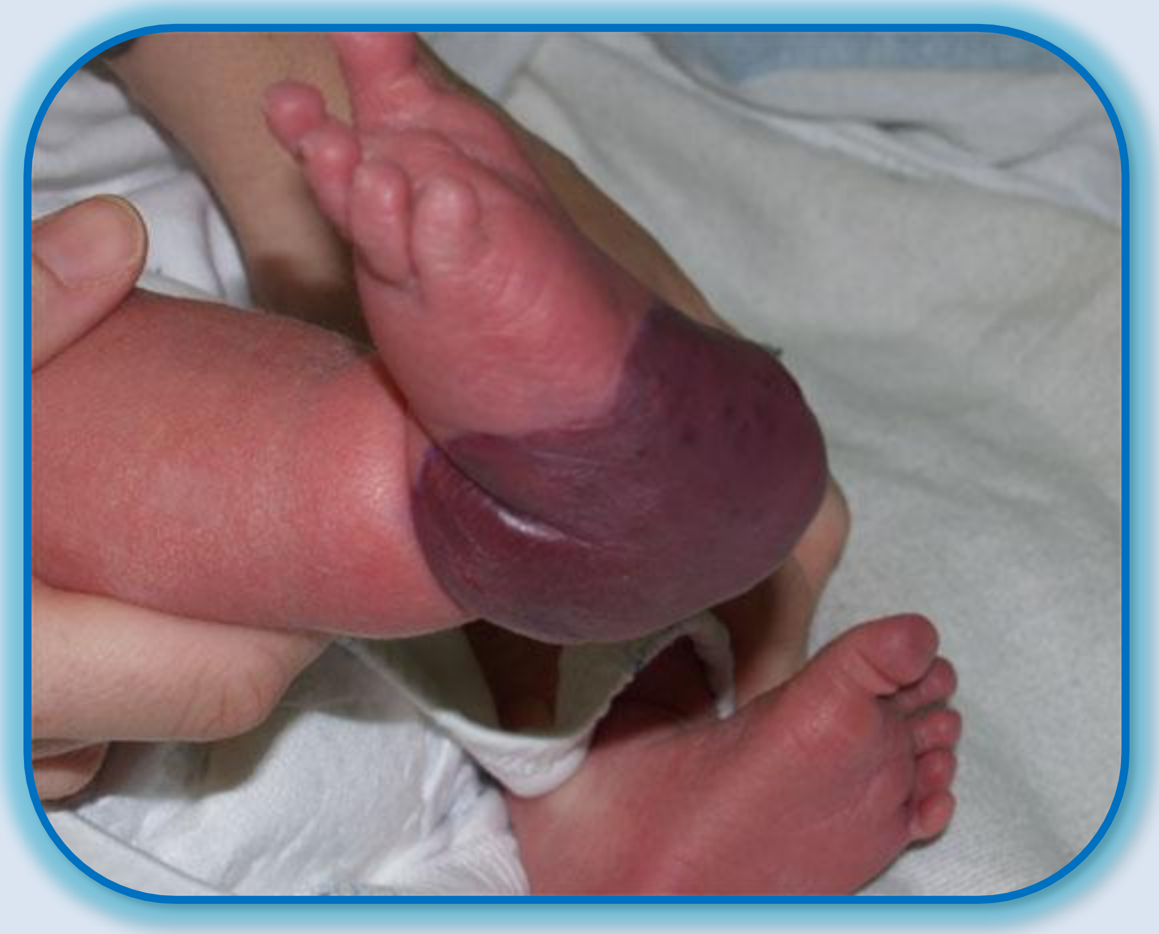
Early Hemangioma



The small, circular, pale area on the left side of the baby's abdomen is the hemangioma. In this position, no problems would be expected.

Lesions located in an area of chronic irritation (diaper area) or near vital structures (eye) can be problematic and may require treatment when they grow and become raised, but typically the best cosmetic result is obtained if the lesion is left to grow and involute spontaneously.

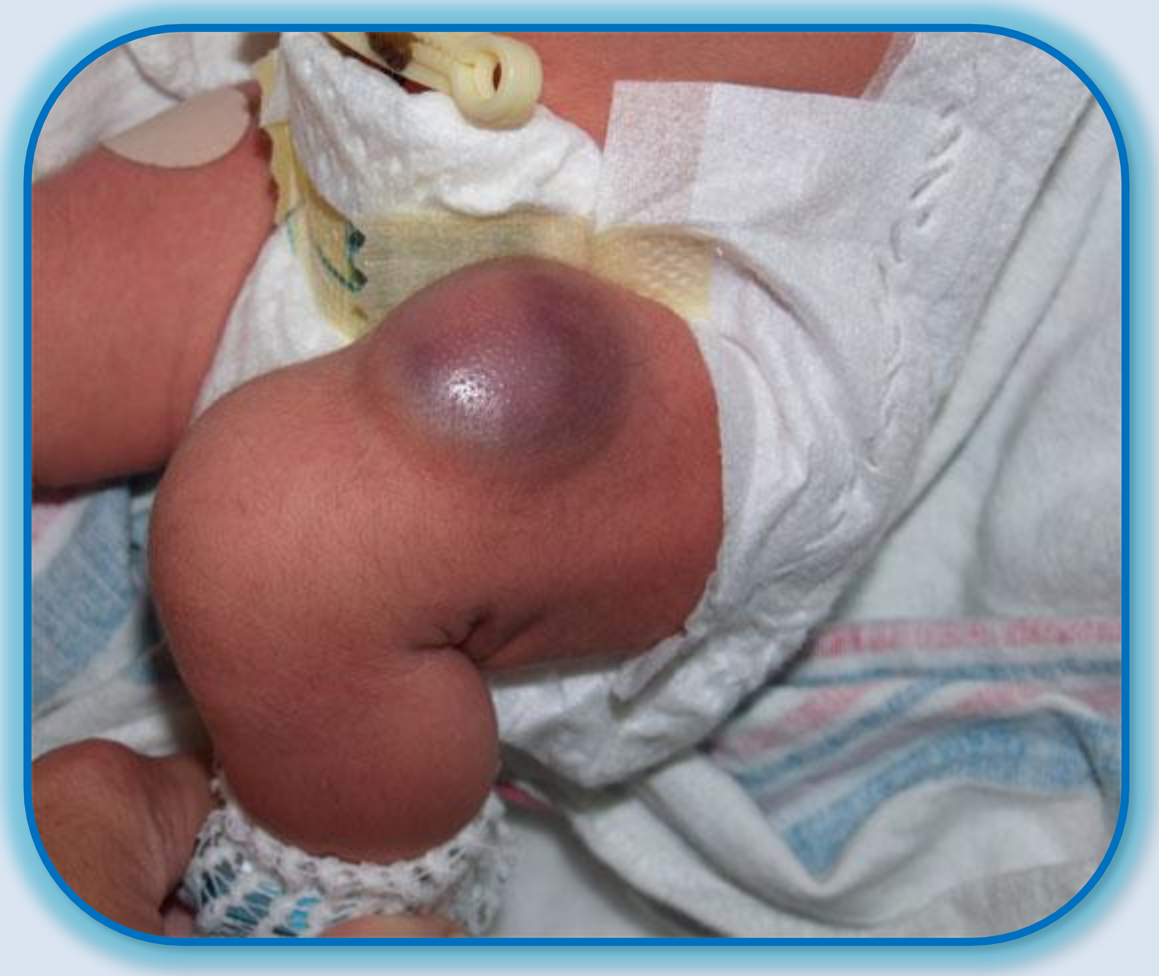
Congenital Hemangioma



A much more unusual presentation of hemangioma is shown here. This vascular lesion on the heel was present at birth.

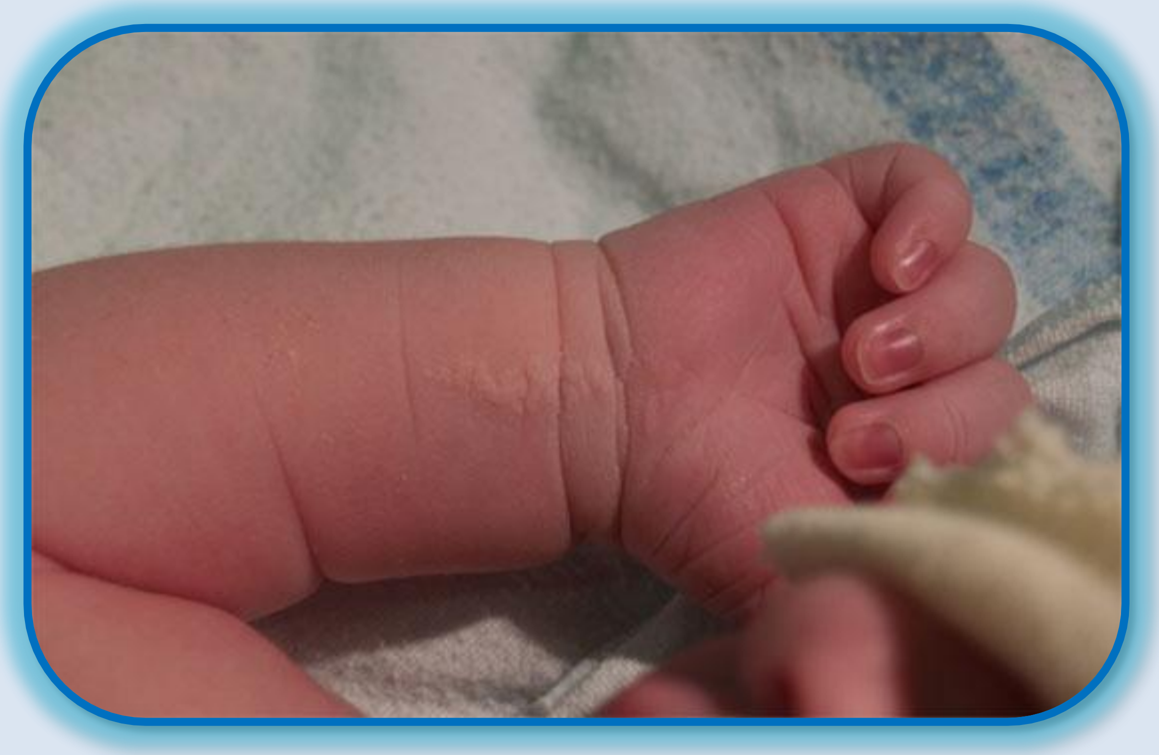
This particular infant did not develop **Kasabach-Merritt syndrome**, though that **was a concern**, and the lesion began spontaneous involution after about 6 months of age.

Congenital Hemangioma



This is another fairly large congenital hemangioma. In this case, the hemangioma appears to have more deep involvement. Again, **unless complications arise, the best course of action seems to be watchful waiting**.

Epidermal Nevus

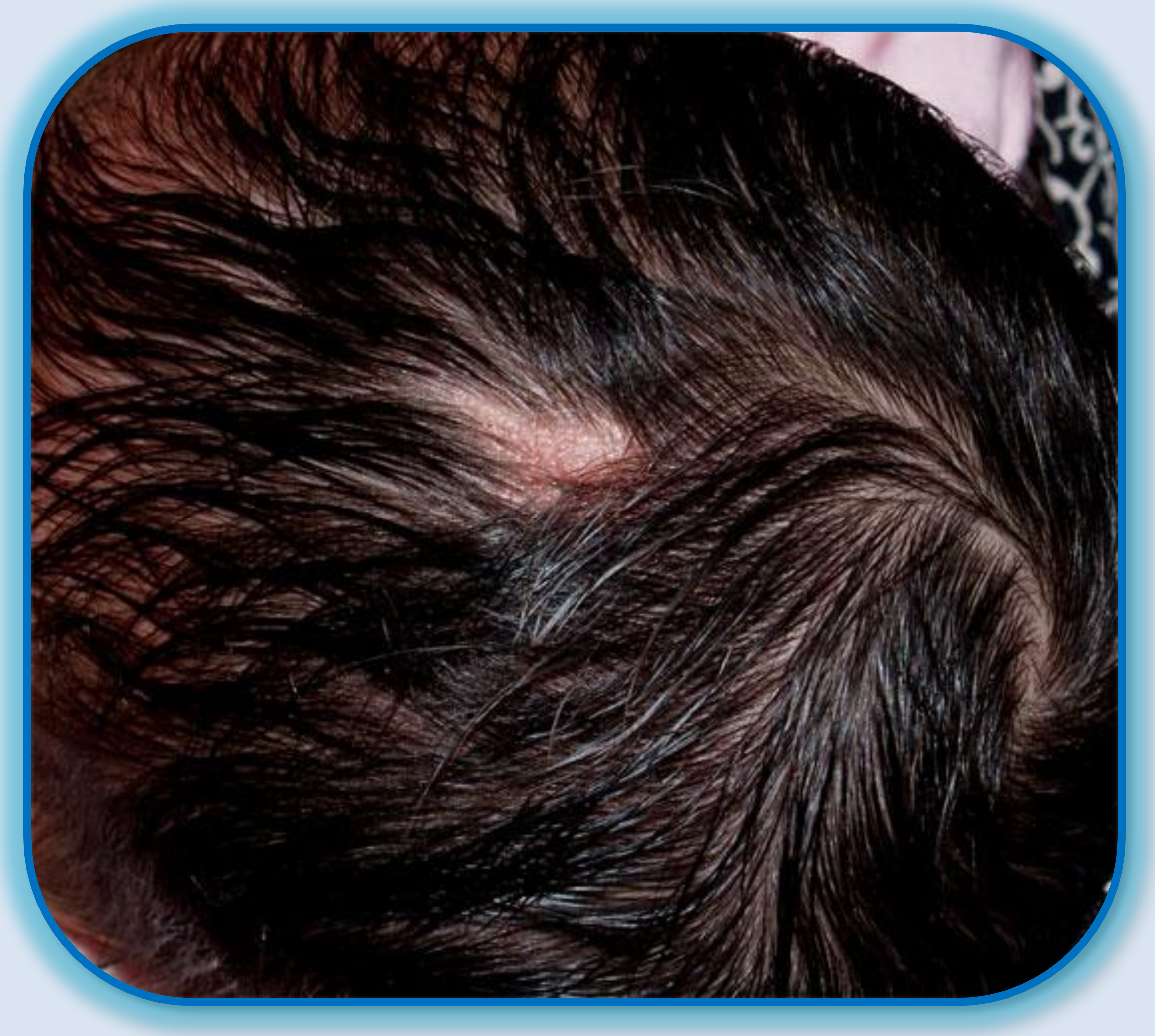


This lesion was present at birth. The lesion is **firm and papular** without any evidence of inflammation. This is consistent with an epidermal nevus.

With time, epidermal nevi usually become more wart-like and scaly.

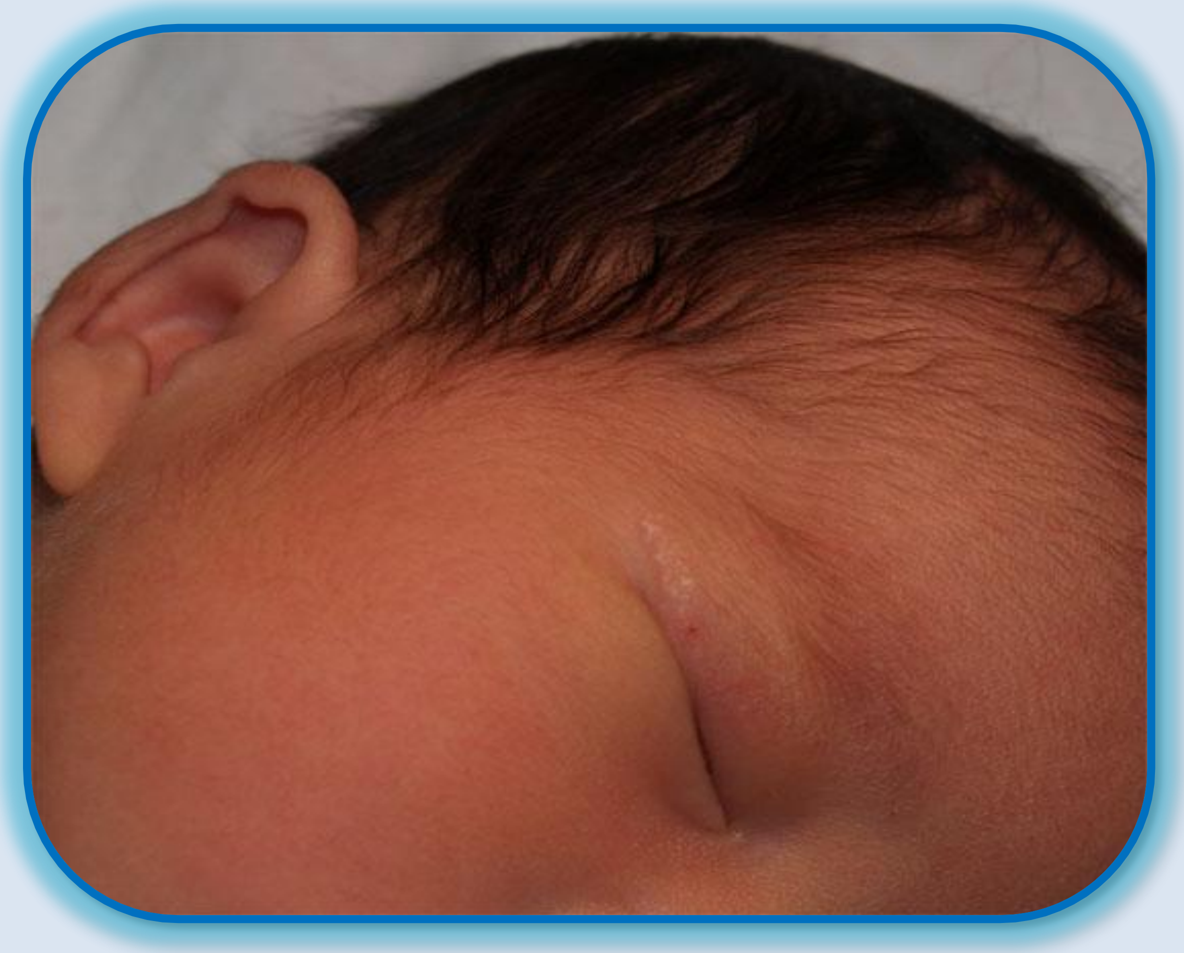
Patients with epidermal nevi may have **associated CNS, bone, and eye abnormalities**, but this is more likely in those with extensive lesions.

Sebaceous Nevus



A sebaceous nevus **(SN of Jadassohn)** is a **yellow-orange, waxy, pebbly** lesion present on the face or scalp of some newborns. Hair follicles are not present within the lesion itself, but lesions on the scalp may be covered over by surrounding hair.

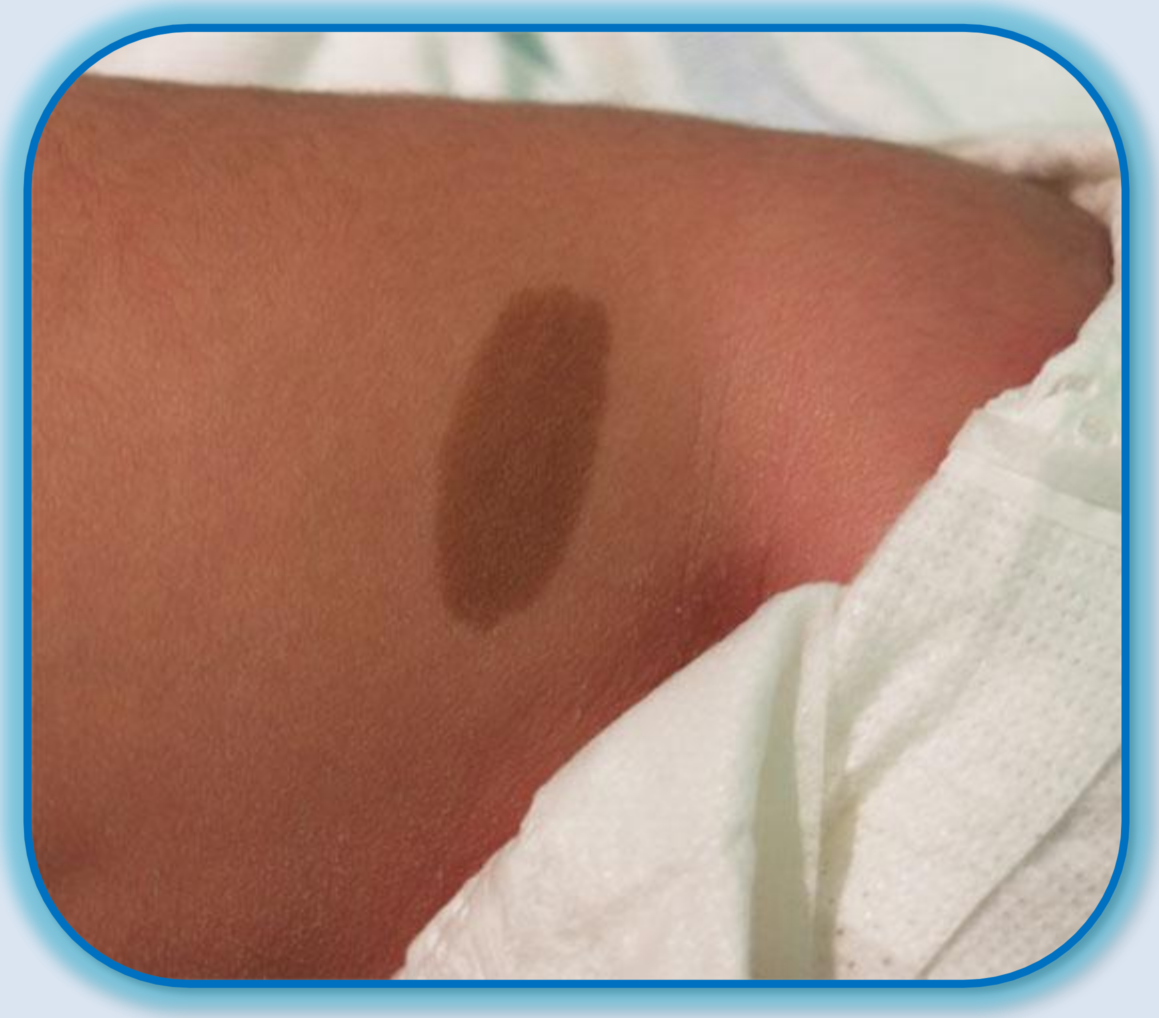
Sebaceous Nevus



Here is another example of sebaceous nevus on the lateral margin of the eyelid. The significance of this finding is primarily related to the fact that it is **sensitive to the androgens** produced during puberty, causing the lesion to become larger and more wart-like, so elective removal may be considered at that time.

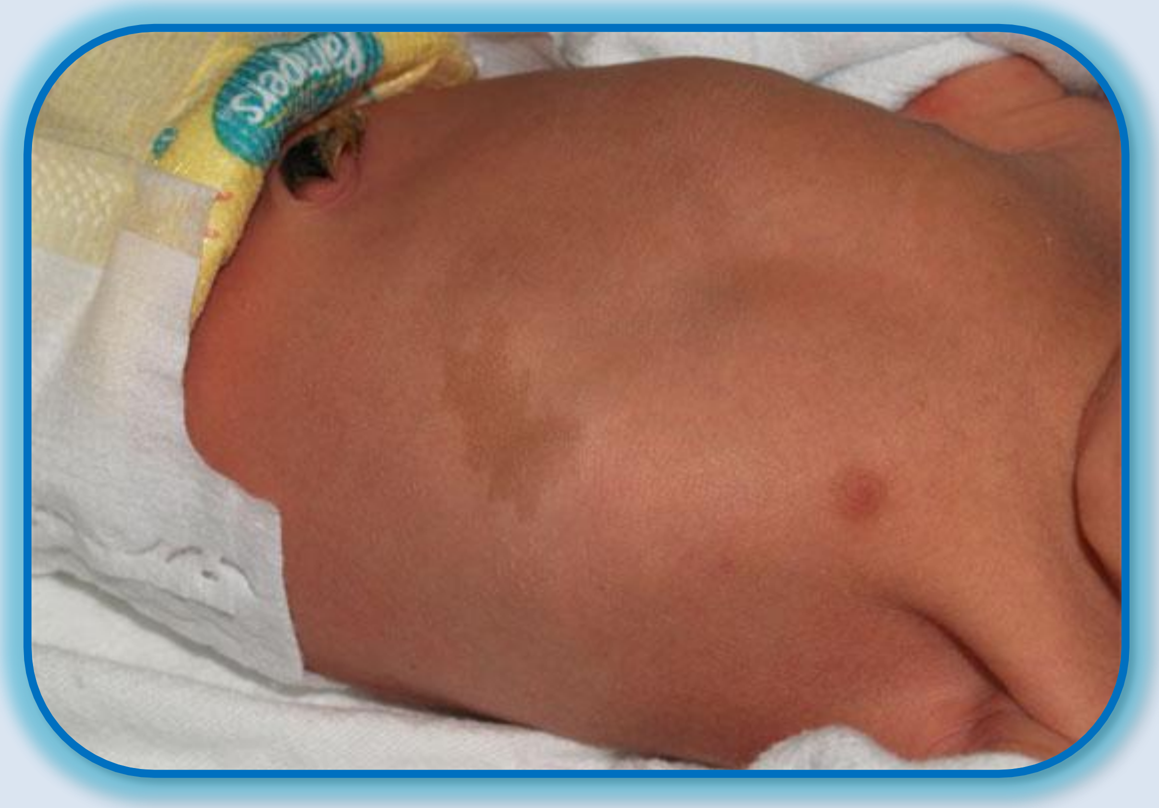
Almost all of the changes that occur within these lesions are benign, but there are a few reports of basal cell carcinomas in older adults, so observation throughout life is important.

Junctional Melanocytic Nevus



The typical lesion is completely **flat** and is medium to **dark brown** in color. It may be present at birth. It may become slightly raised as the infant grows and may become a compound nevus if intradermal melanocytes develop. It is considered a **benign** lesion.

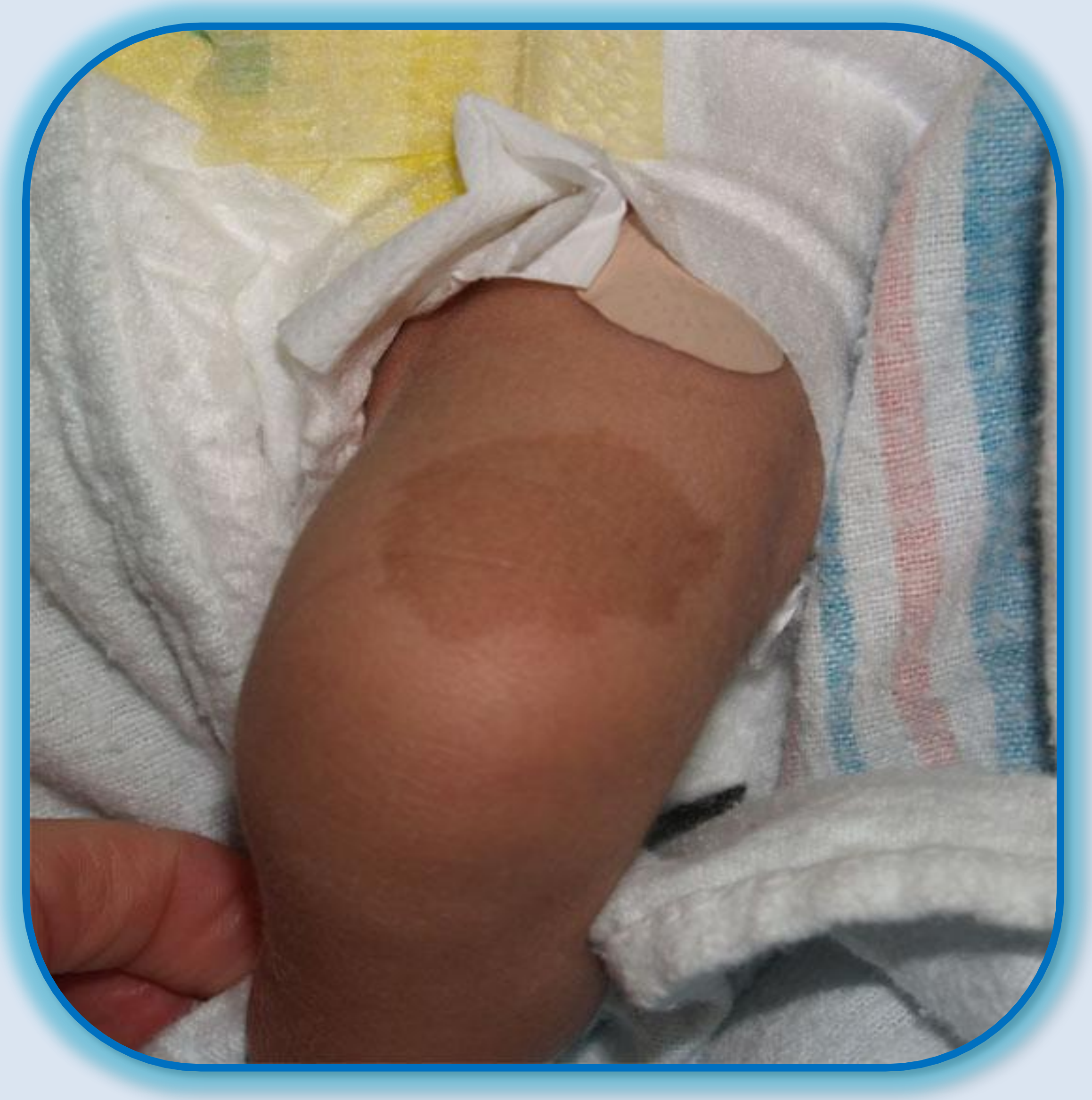
Cafe Au Lait Spot



Cafe au lait spots are **lighter in color than melanocytic nevi**, but they also may be congenital macules. They are caused by an increased amount of melanin in both melanocytes and epidermal cells, and may increase in number with age.

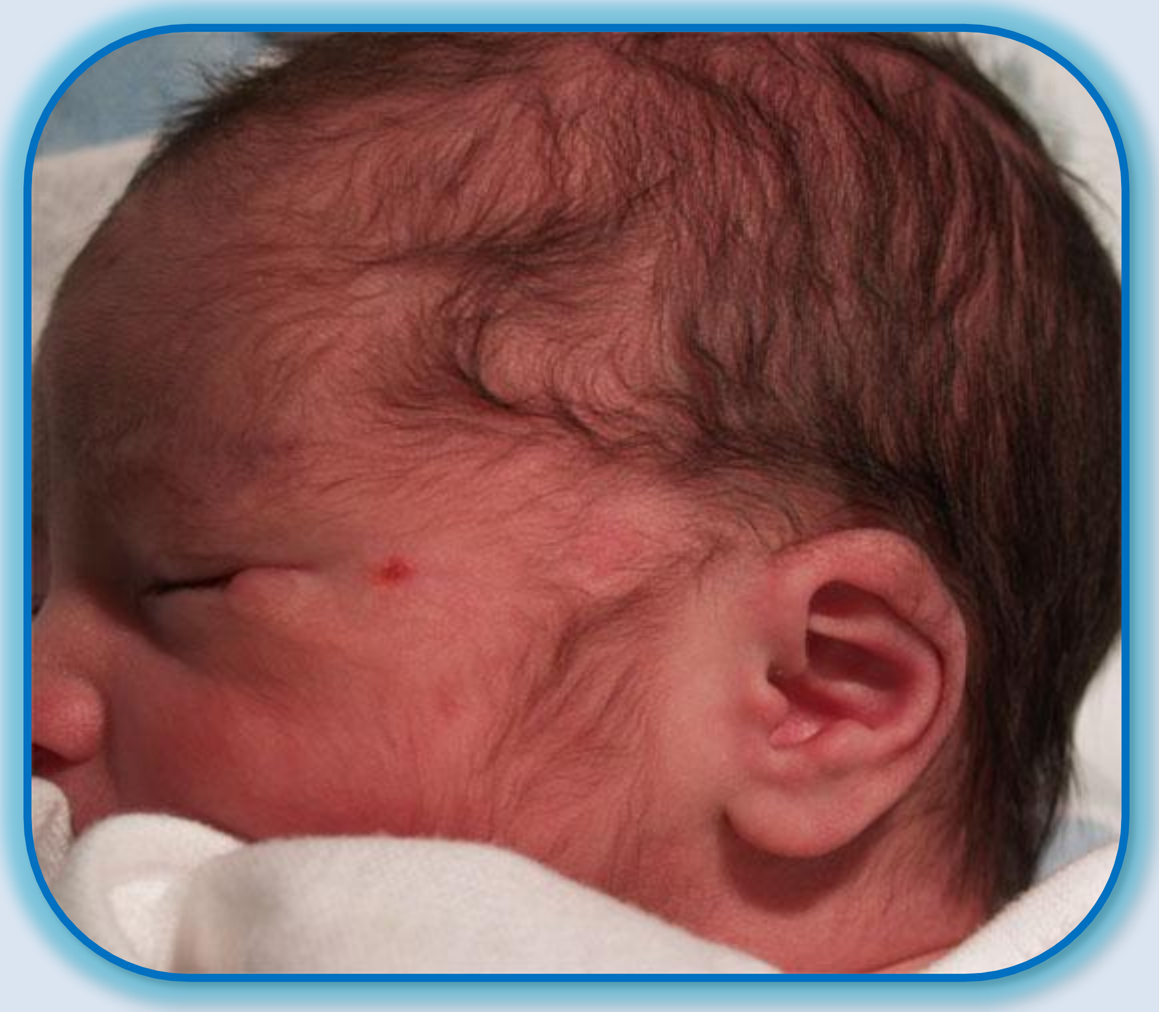
Most children with cafe au lait spots do not have **neurofibromatosis**, but the **presence of six or more of these spots that are larger than 0.5cm** diameter is considered to be a major clue to the diagnosis.

Cafe Au Lait Spot



Here is another example of cafe au lait spot. Again in this patient, the spot was an isolated physical finding, so no further evaluation was necessary.

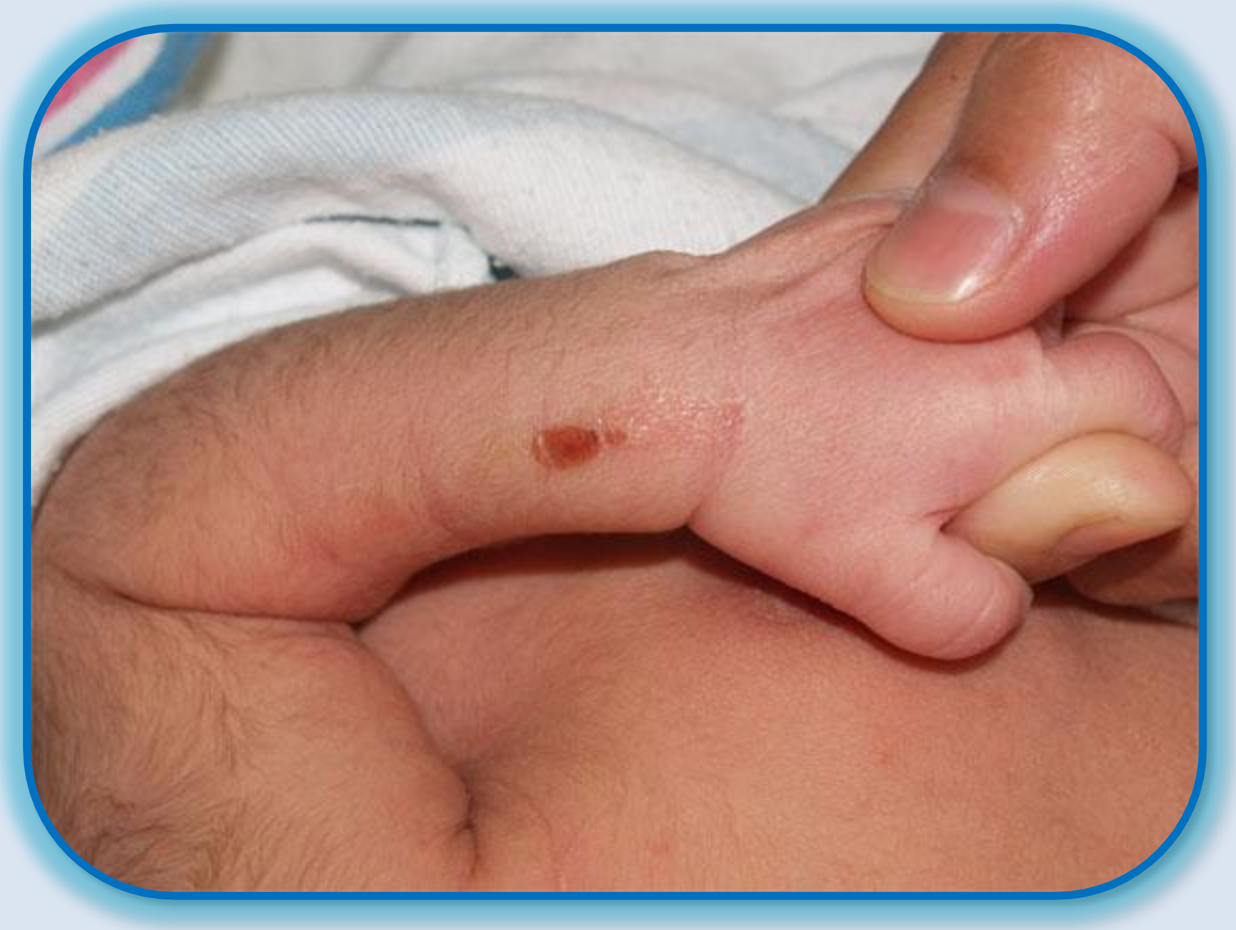
Cutis Aplasia



On examination of this infant, there were 3 areas of abnormality (the nodule under the left eye, the red "excoriated" area lateral to the nodule, and the hairless, circular lesion anterior to the ear). The etiology of the nodule is unknown at this time, but the other two areas were felt to be consistent with cutis aplasia.

Cutis aplasia is often thought of in **association** with **trisomy 13**, but it can also be an **isolated** finding in an otherwise well newborn.

Sucking Blister

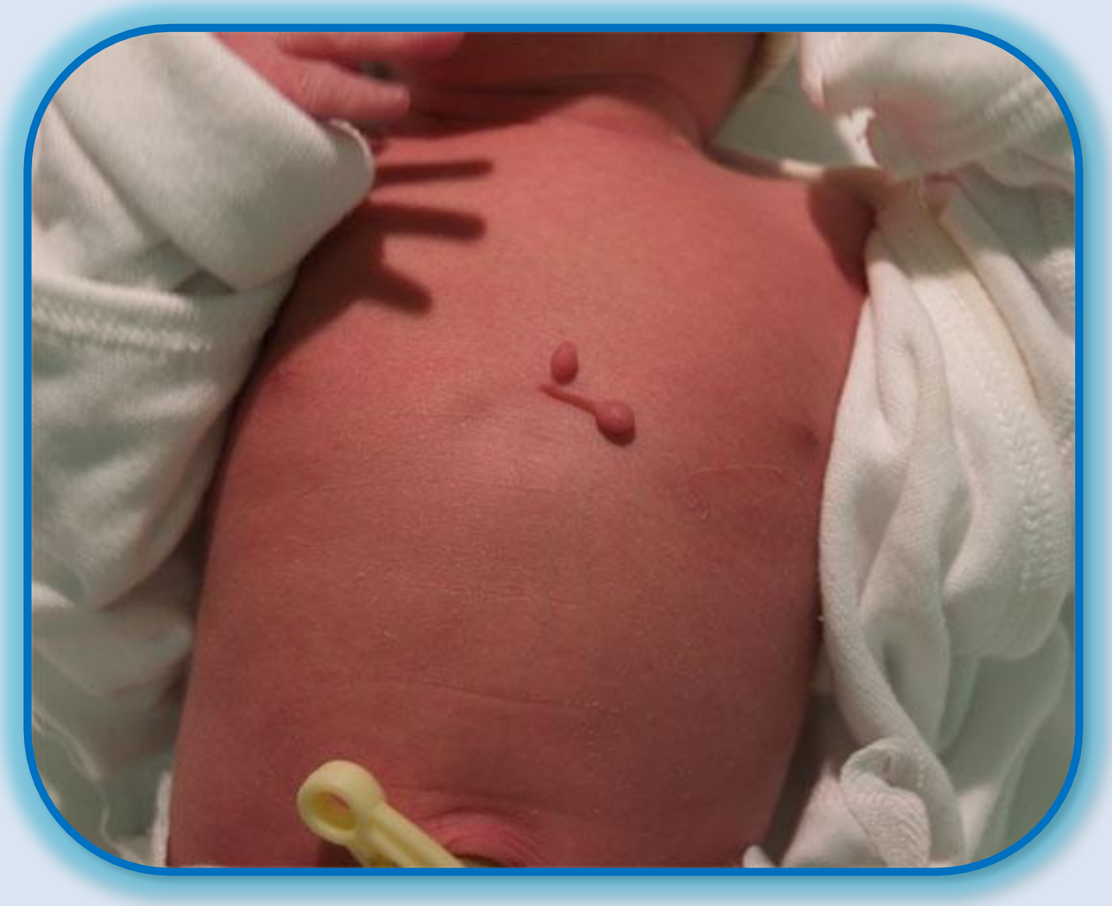


This lesion is fairly typical of the appearance of a sucking blister **at birth**. It is created by the infant sucking on his extremity.

Sucking blisters are **solitary** lesions that occur only in areas accessible to the infant's mouth. They are **benign** and **resolve spontaneously**.

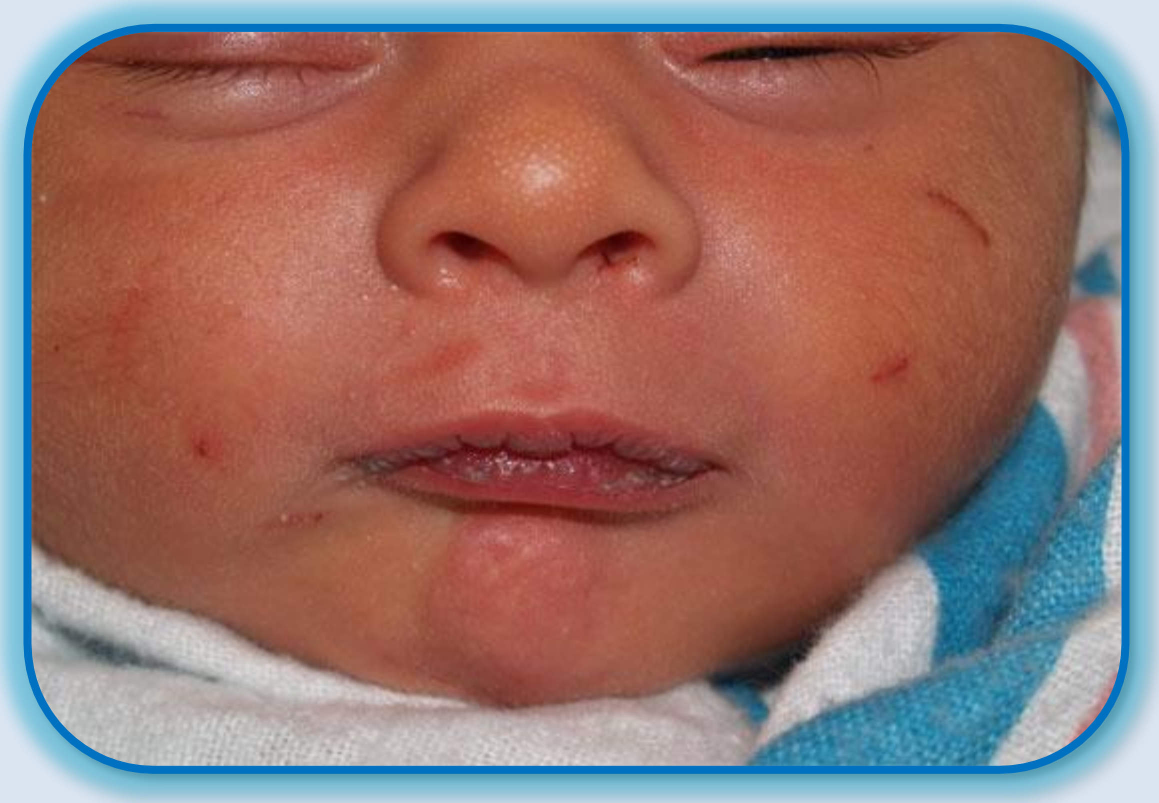
The appearance and location of the lesion is usually sufficient for diagnosis, but if the infant is observed sucking on the affected area, the diagnosis is certain.

Skin Tags



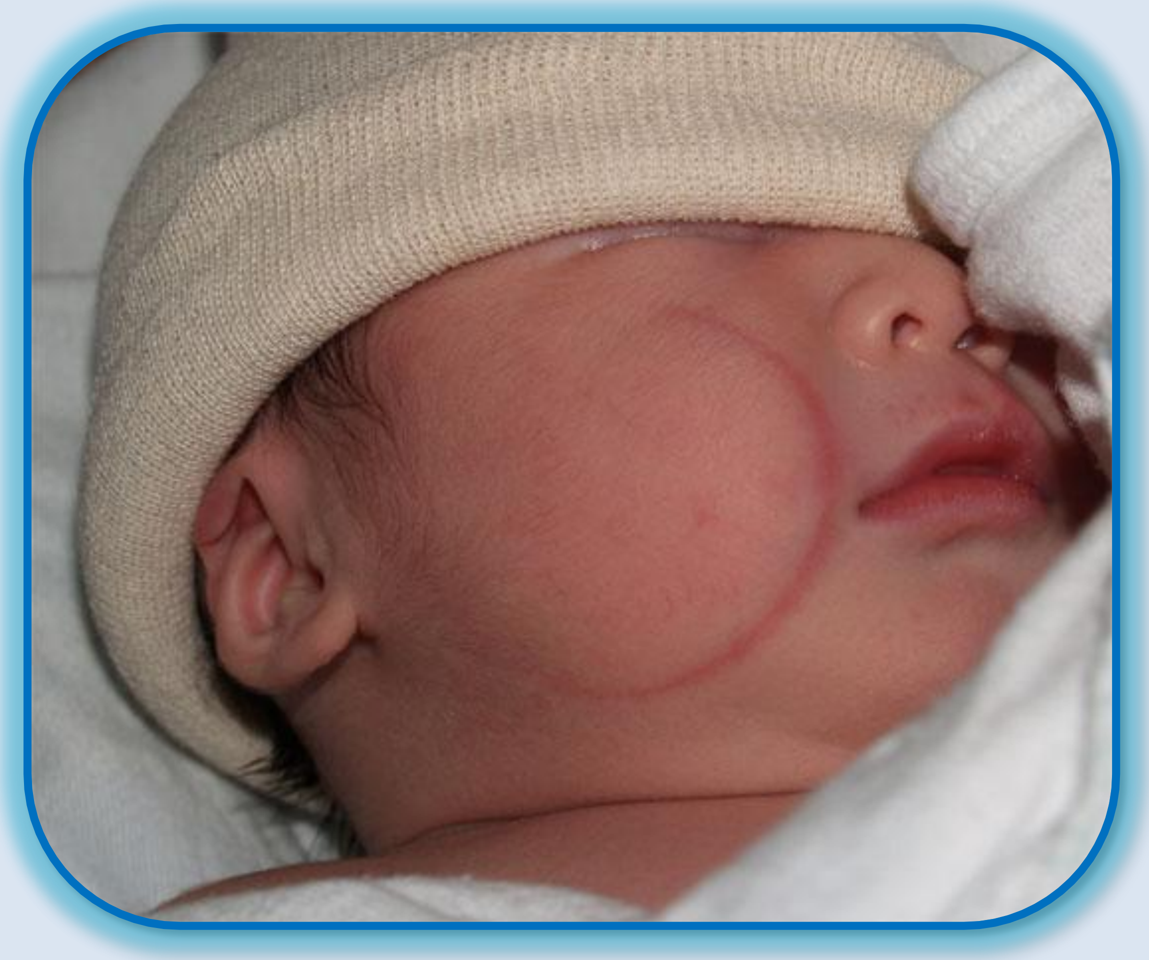
These tags are rather typical in appearance, but in an unusual location. Because of the narrow diameter of the stalk, the decision was made to clip these with scissors instead of tying them off.

Fingernail Scratches



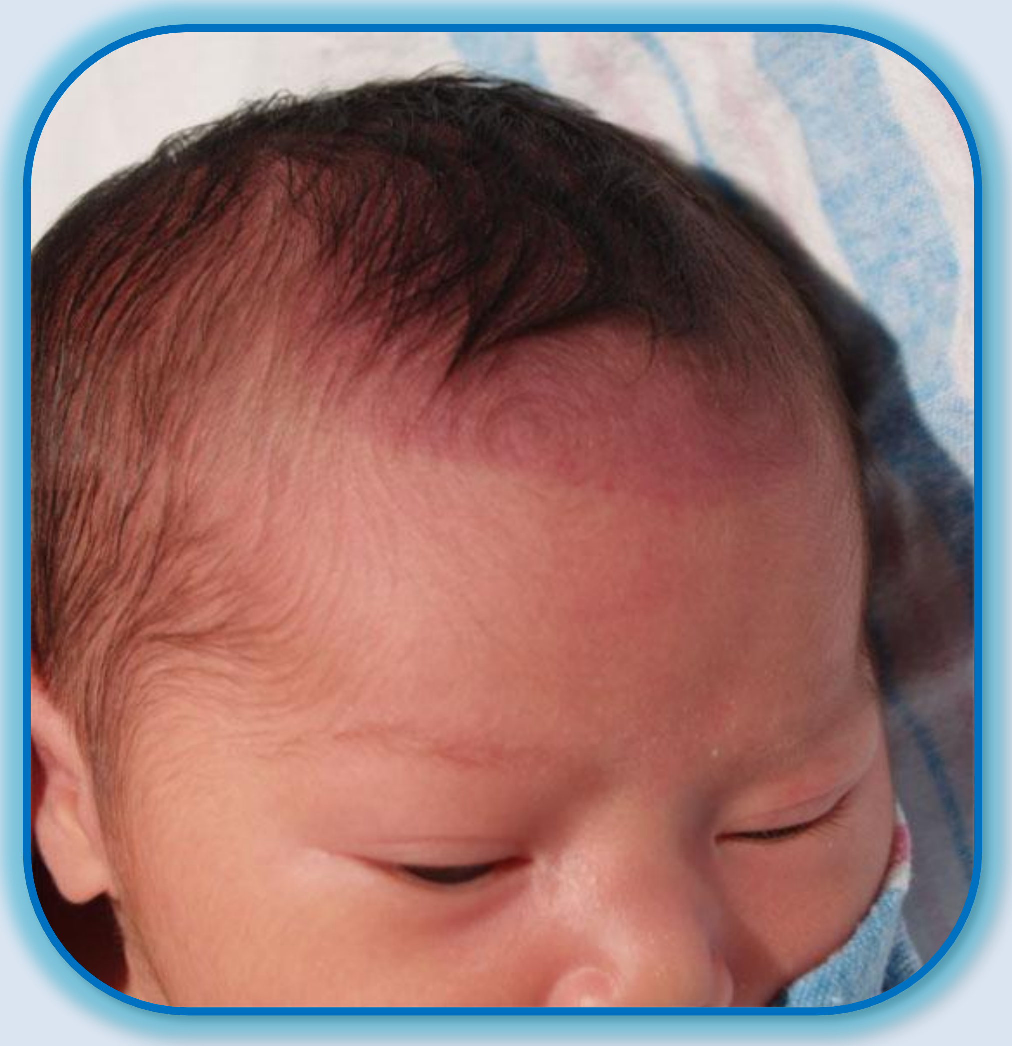
Self inflicted fingernail scratches are common. In this infant, two linear scratches can be clearly seen on the patient's left cheek and several other minor scratches are also visible. In an effort to prevent scratches, the hands of a newborn are frequently covered with long sleeves, mittens or socks.

Forceps Mark



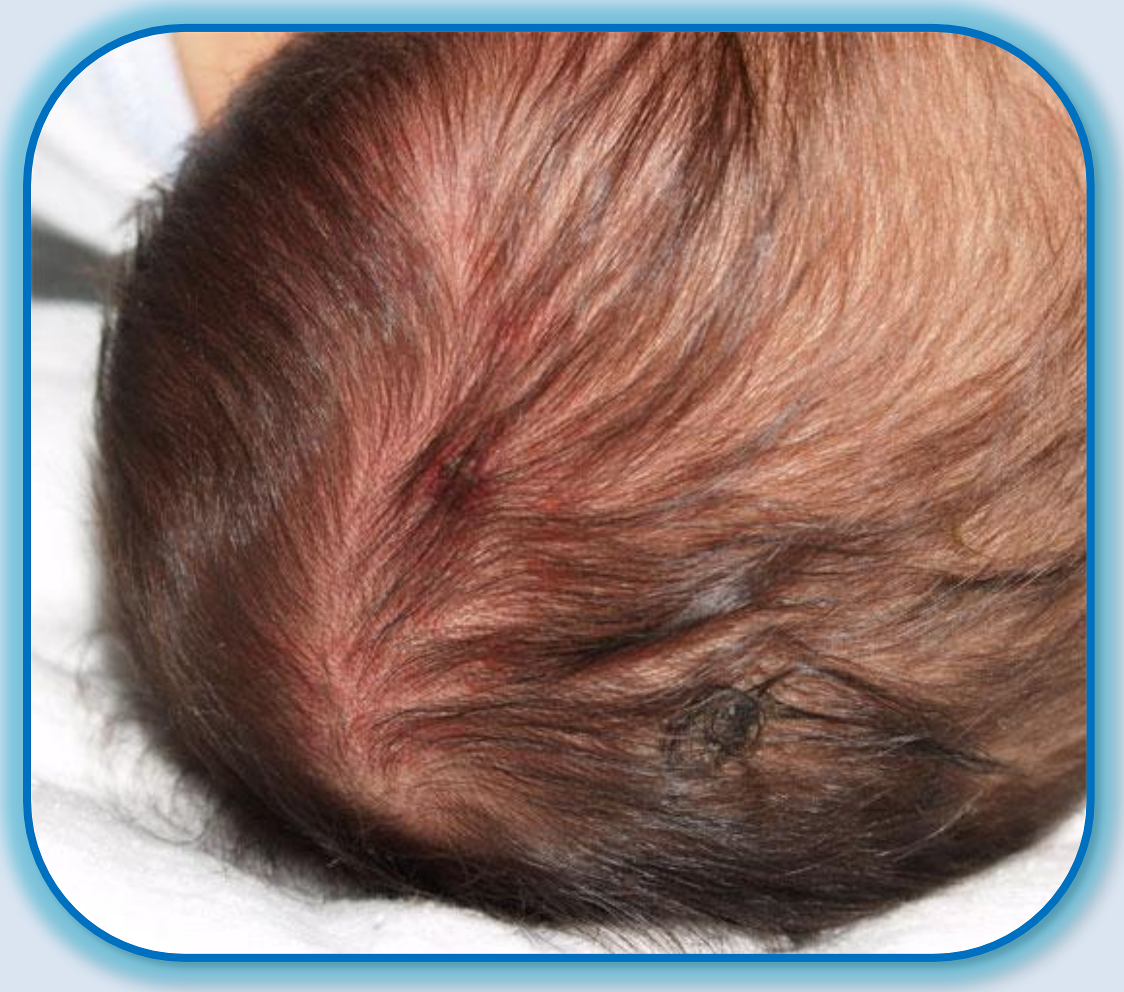
When forceps are needed to assist a delivery, this type of semi-circular, superficial red mark can occasionally be seen on the sides of the infant's face. These marks have **no consequence** and will **spontaneously resolve**. In rare cases when the skin is abraded, antibiotic ointment may facilitate healing.

Vacuum Mark



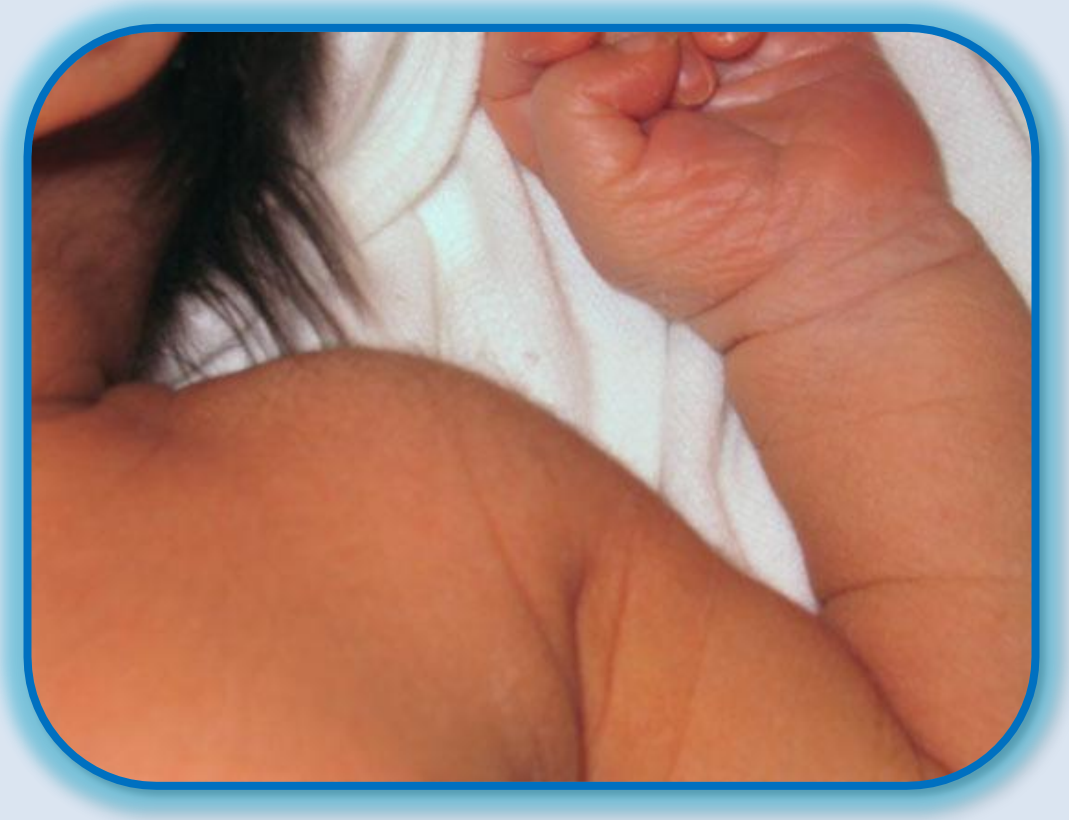
Vacuum extraction can also leave marks on the infant's head. Typically, the bruising is similar to that which occurs normally during the process of delivery except for the fact that it is **well circumscribed**. In some cases, however, the bruising **can be** more severe with associated blisters or sloughing of the skin, or with underlying cephalohematoma or subglaeal hemorrhage. In this infant, the bruising is fairly mild, but can be easily seen because it extends beyond the hairline in the front. This finding **spontaneously resolved**.

Scalp Electrode Site



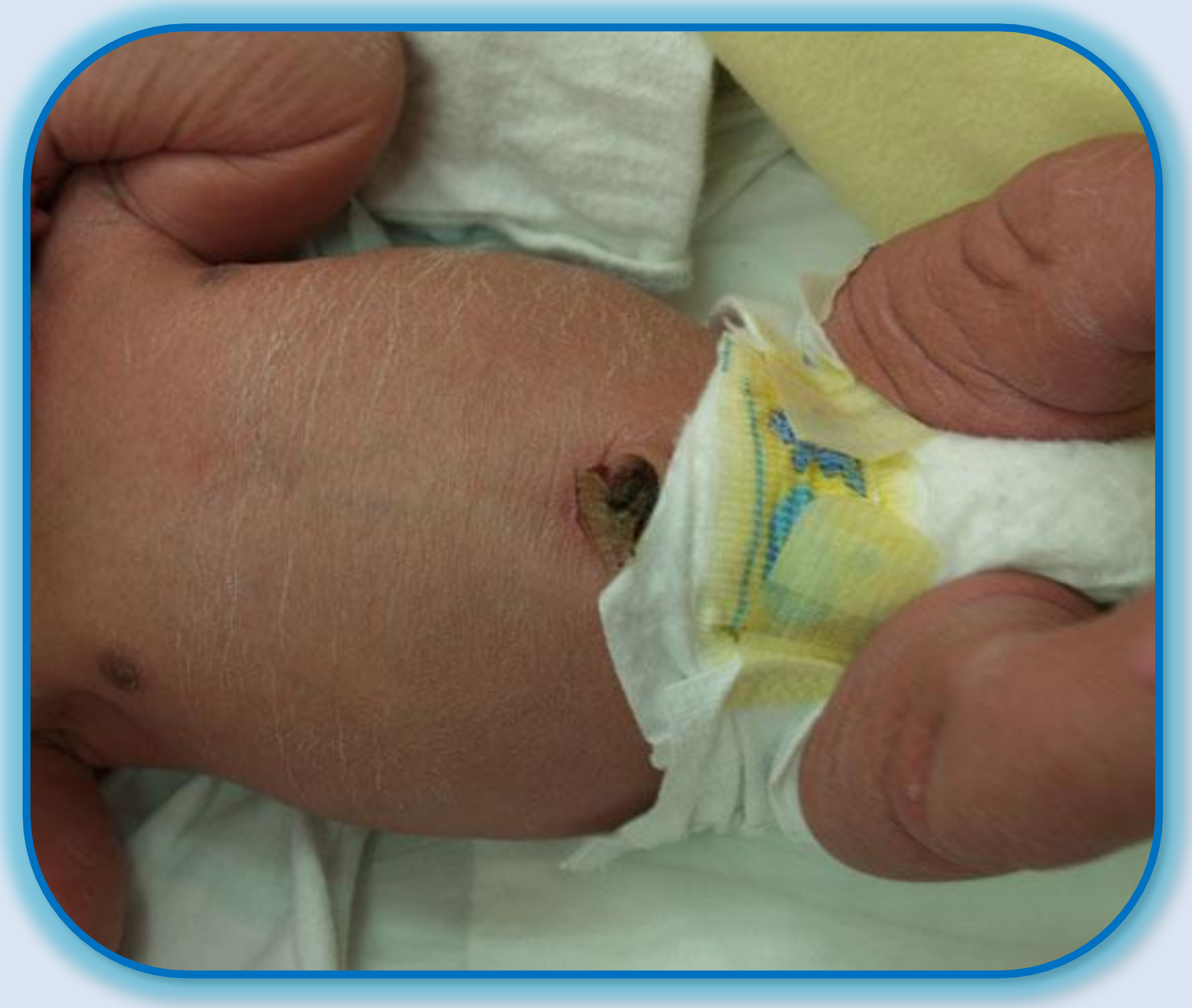
When a scalp electrode is used for internal monitoring prior to delivery, a small circular scab can often be seen at the site where the monitor was. In this child, the scalp electrode site is the slightly red area with central darkness in the middle of the photograph.

Lanugo



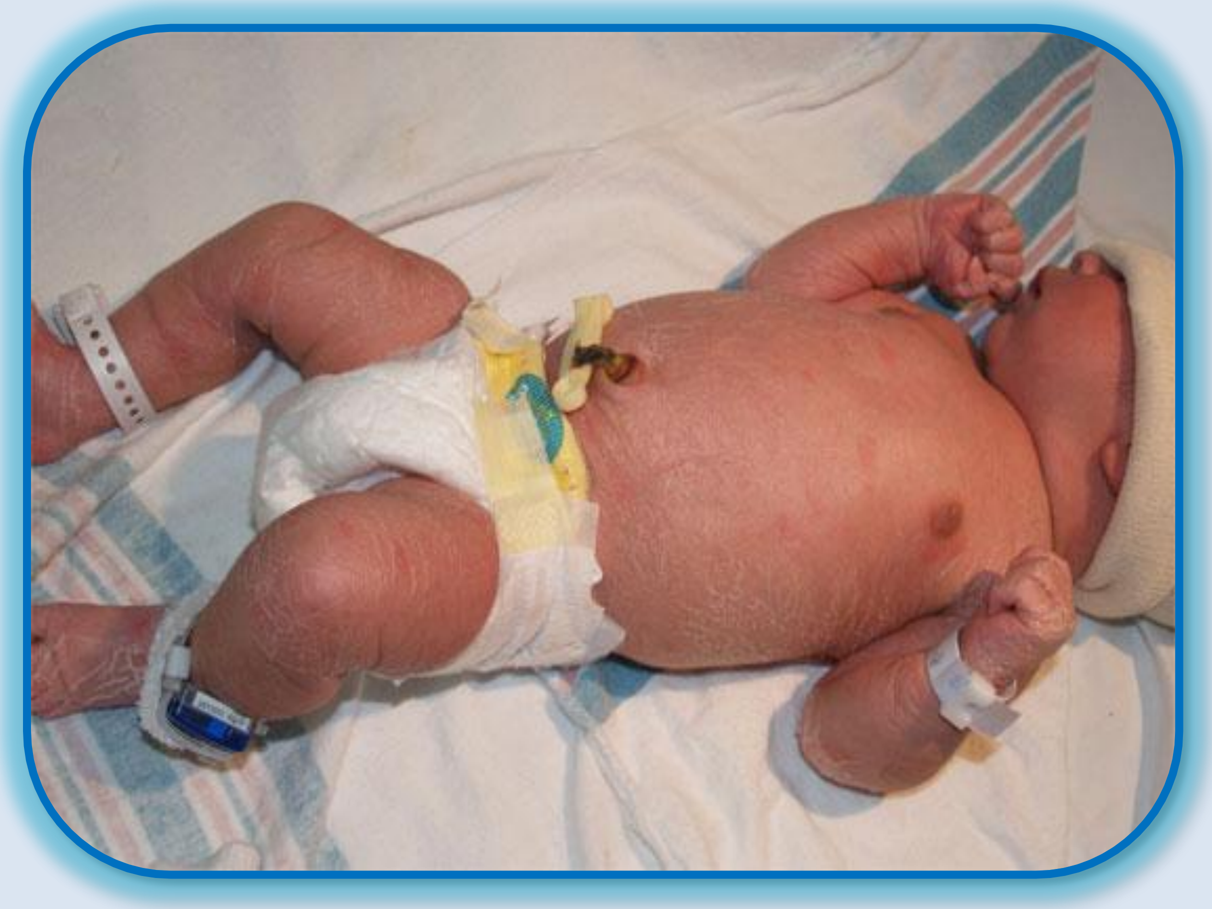
The downy hair seen over the shoulder is lanugo. Although this is present to a much greater degree **in premature** infants, term babies also have variable amounts of lanugo present at birth, as evidenced in this photo.

Normal Peeling



A **dry, flaky**, peeling appearance of the skin is **very common** in newborns. Although this can be distressing to parents, it does not need treatment and will **spontaneously resolve**.

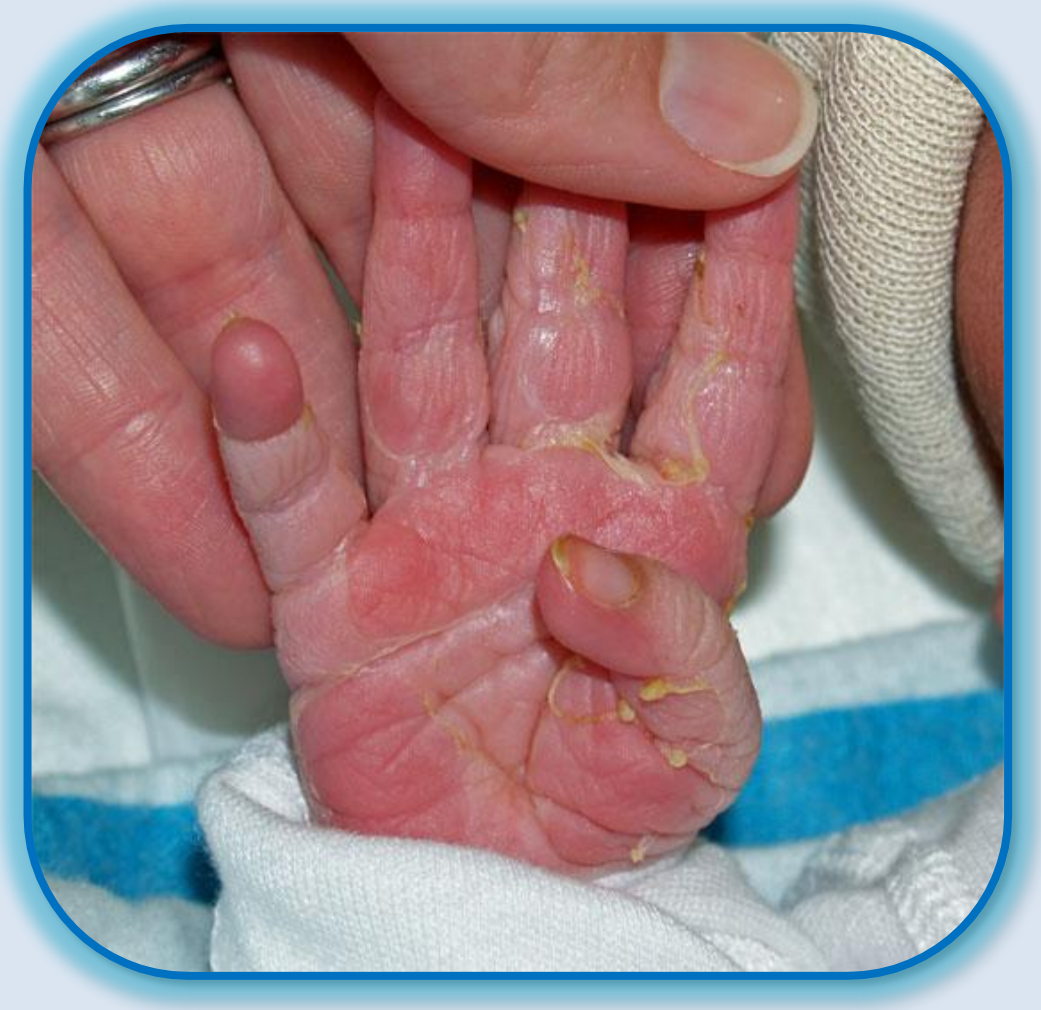
Normal Peeling



This is another example of a **post-dates** infant with dry, peeling skin. On the day of birth, the skin of this baby had a very **leathery** appearance. This photograph was taken on the second day, when the skin had dried out and the peeling was more visible.

The red blotches visible on the chest, right forearm, and legs are erythema toxicum and are unassociated with the peeling.

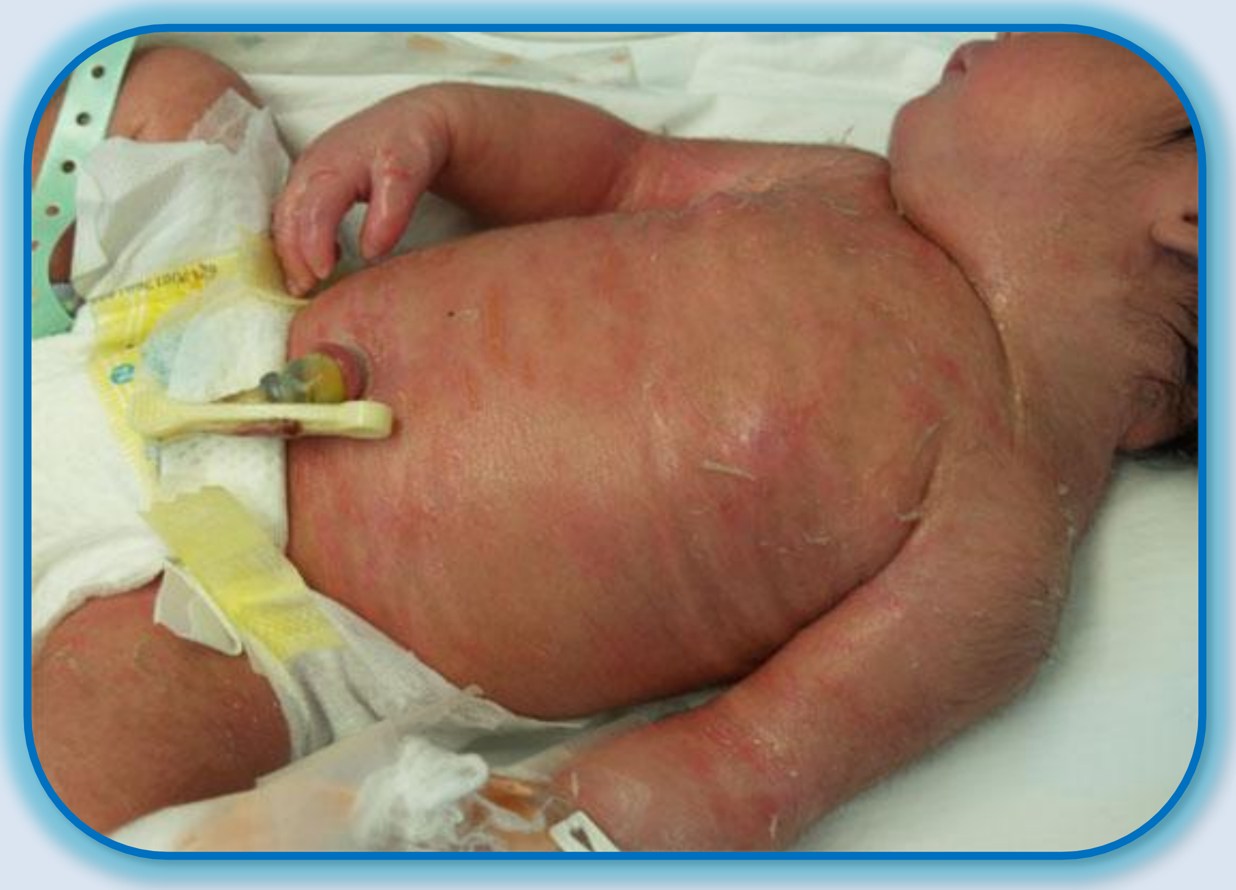
Normal Peeling



The hands and feet are especially **common** places to observe peeling. Often associated with infants who are **post dates**, many term babies exhibit this kind of peeling as well.

In this patient, the skin and nails are stained yellow from the presence of meconium in utero.

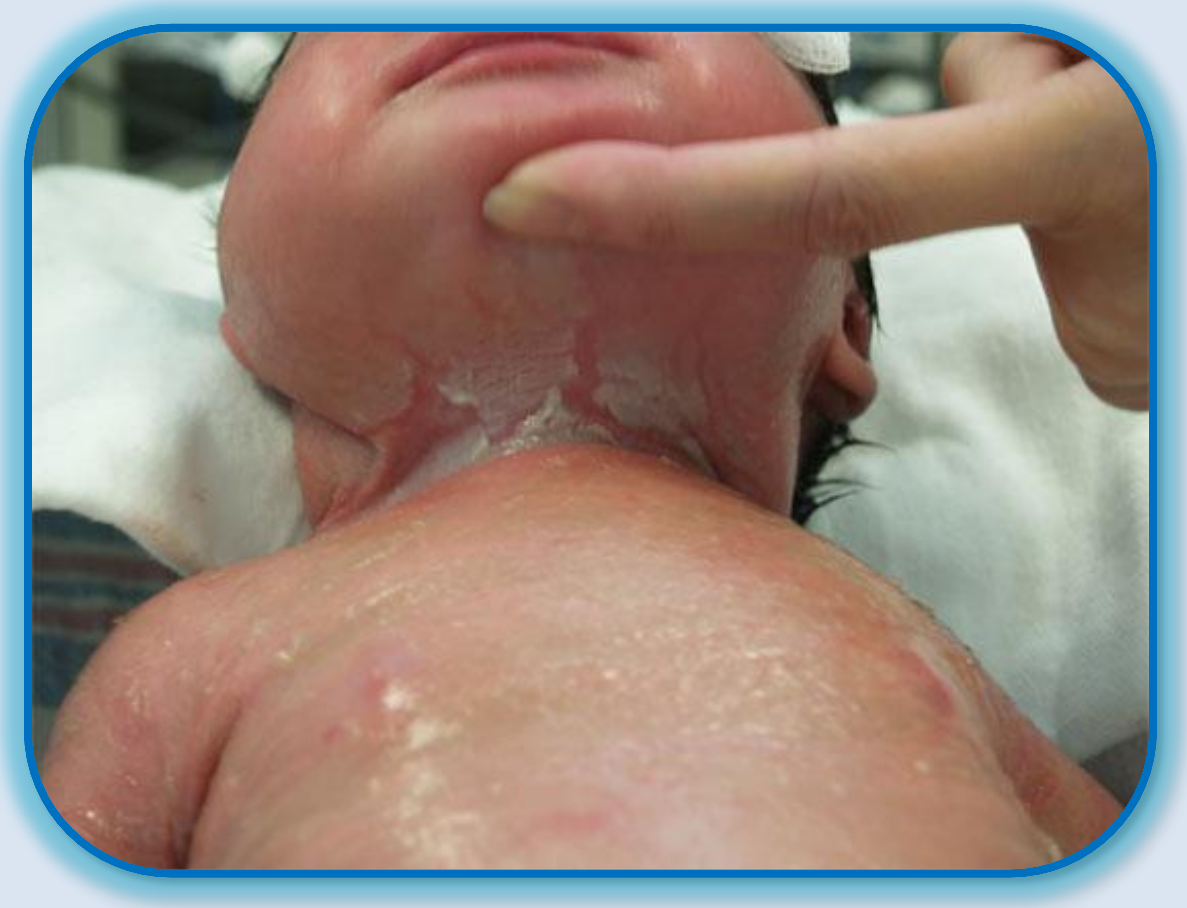
Icthyosis



In contrast, this type of peeling is **not normal**.

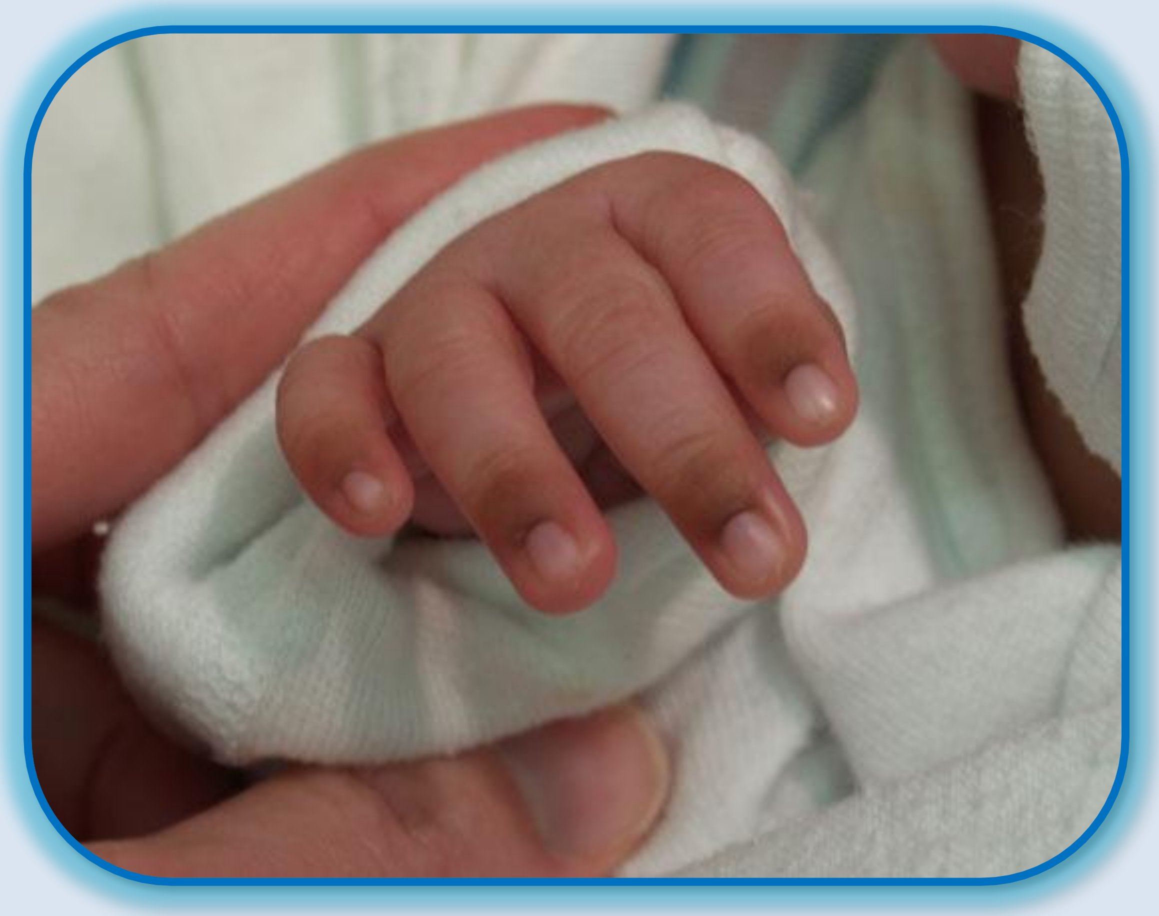
Notice how the **skin under the peeled areas is red and fissured** and how the **fingers** on the right hand appear **edematous**. This newborn had an uncomplicated pregnancy and delivery, but this skin appearance in the delivery room prompted transfer to the NICU for further evaluation. For this baby, **Aquaphor** was liberally applied to the skin, and the infant was kept in an **isolate to minimize fluid losses**.

Icthyosis



This is the same infant as in the previous photo. Here, deeper **fissuring** can be seen in the area under the chin. Involvement of both pediatric dermatologists and geneticists is appropriate when dealing with congenital icthyosis.

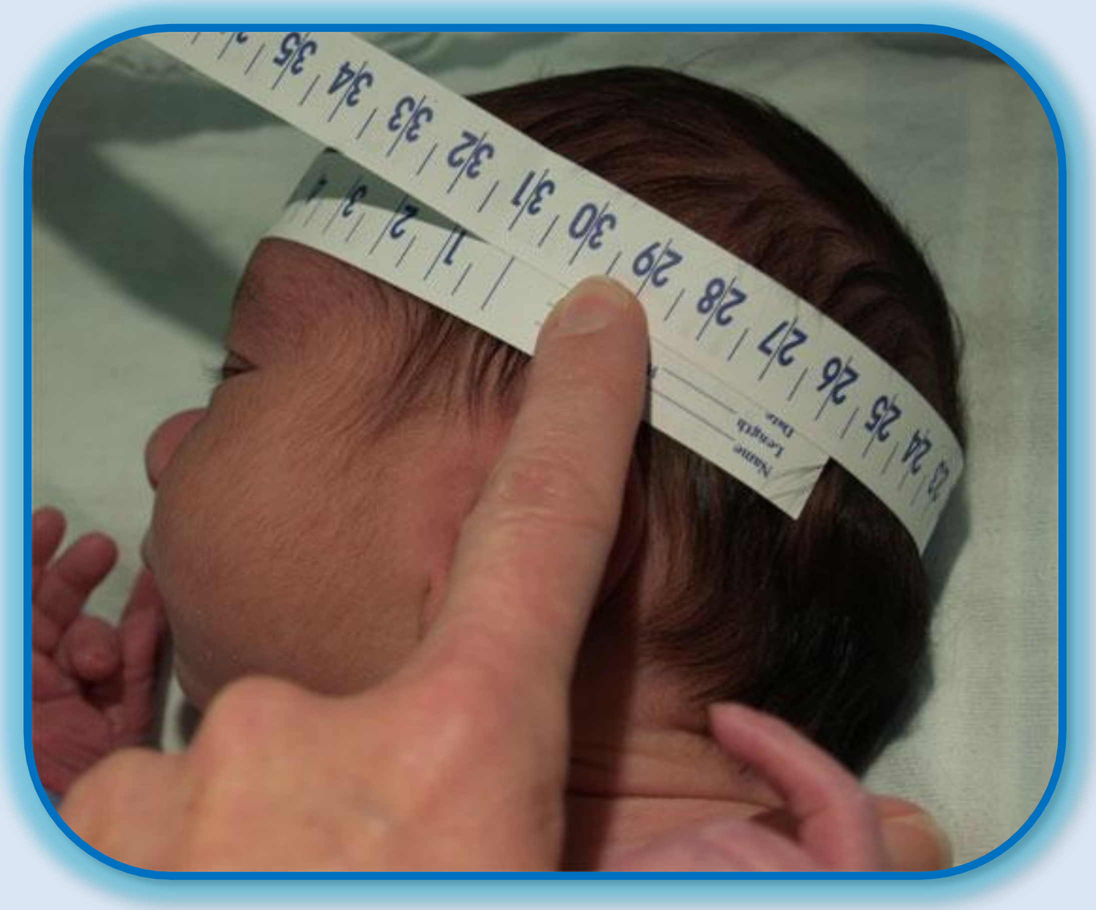
Normal Skin Pigment



The increased pigment seen at the base of the nails is this African-American infant is entirely normal. When the parents' skin tone is dark, the overall skin tone of the baby will typically be much lighter than the parents at birth. The increased melanin can be seen in some areas like, around the nails, over the helix of the external ear, around the umbilicus, and over the genitalia.

Head

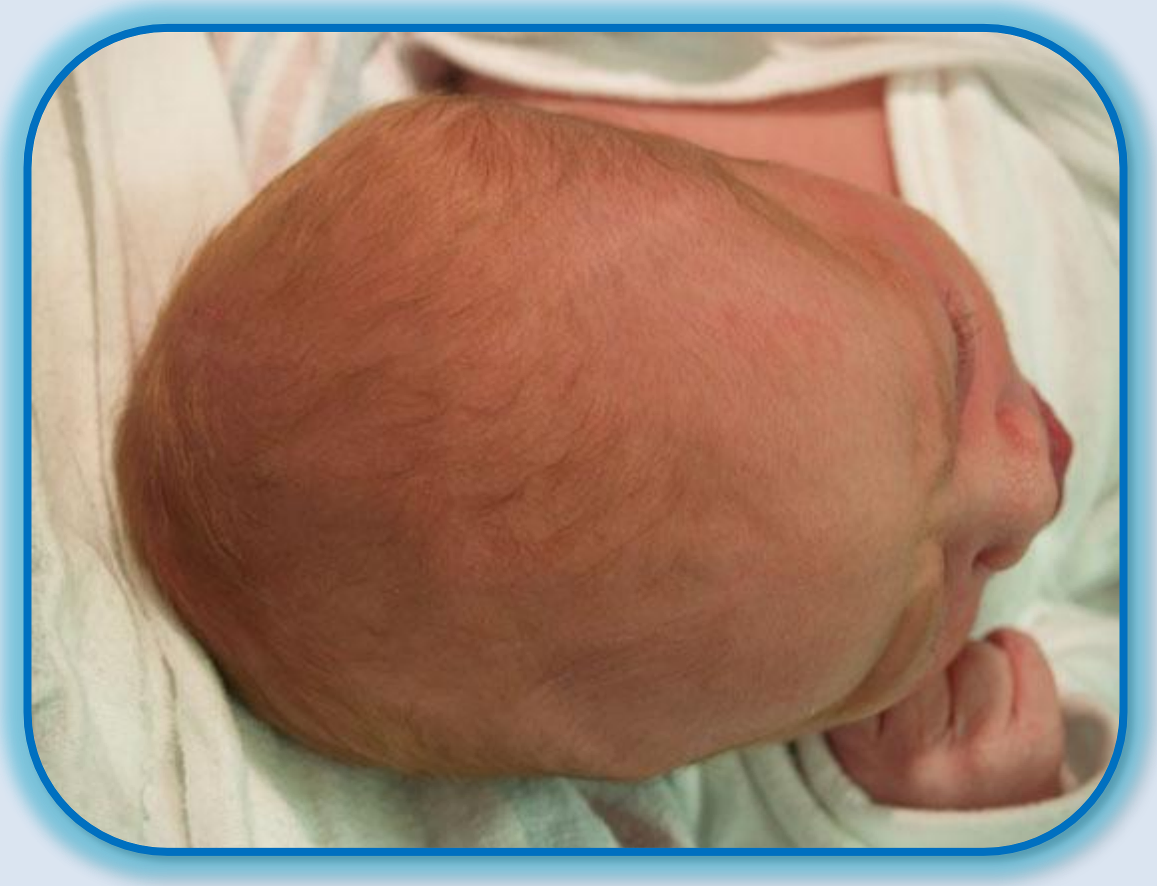
Head Circumference



One of the first things to assess when evaluating the head of the newborn is the Occipital Frontal Circumference **(OFC)**. This simple measurement may be the first clue to an underlying problem.

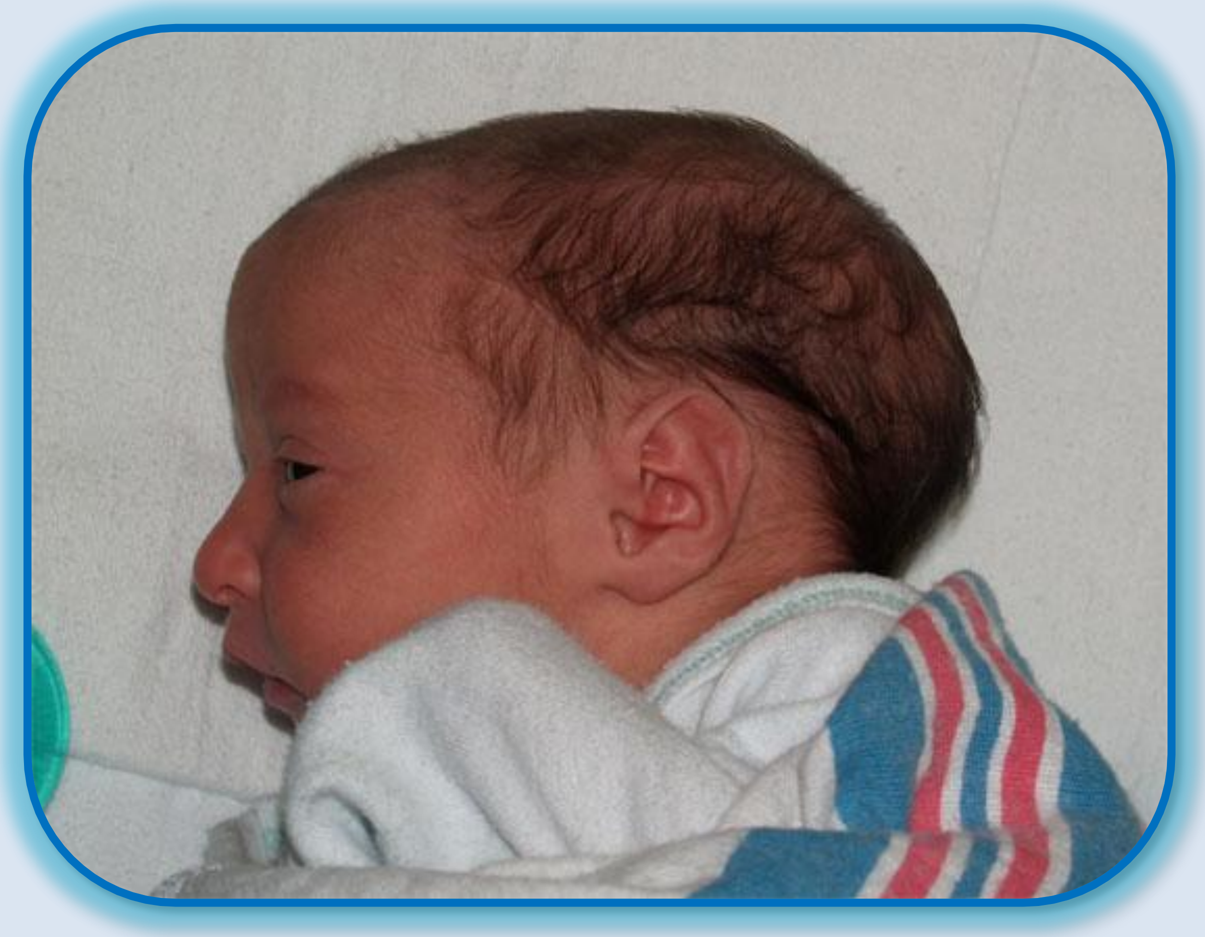
The 50th percentile for OFC of a term newborn is 34 cm, so for the infant above who had a normal weight and length for a term infant (near 50th %ile for age), a measurement of 30.5 cm is strikingly abnormal (<< 10th %ile for age). Further evaluation is indicated here; head imaging, screening for TORCH infection, and assessment for chromosomal abnormalities should all be considered.

Molding



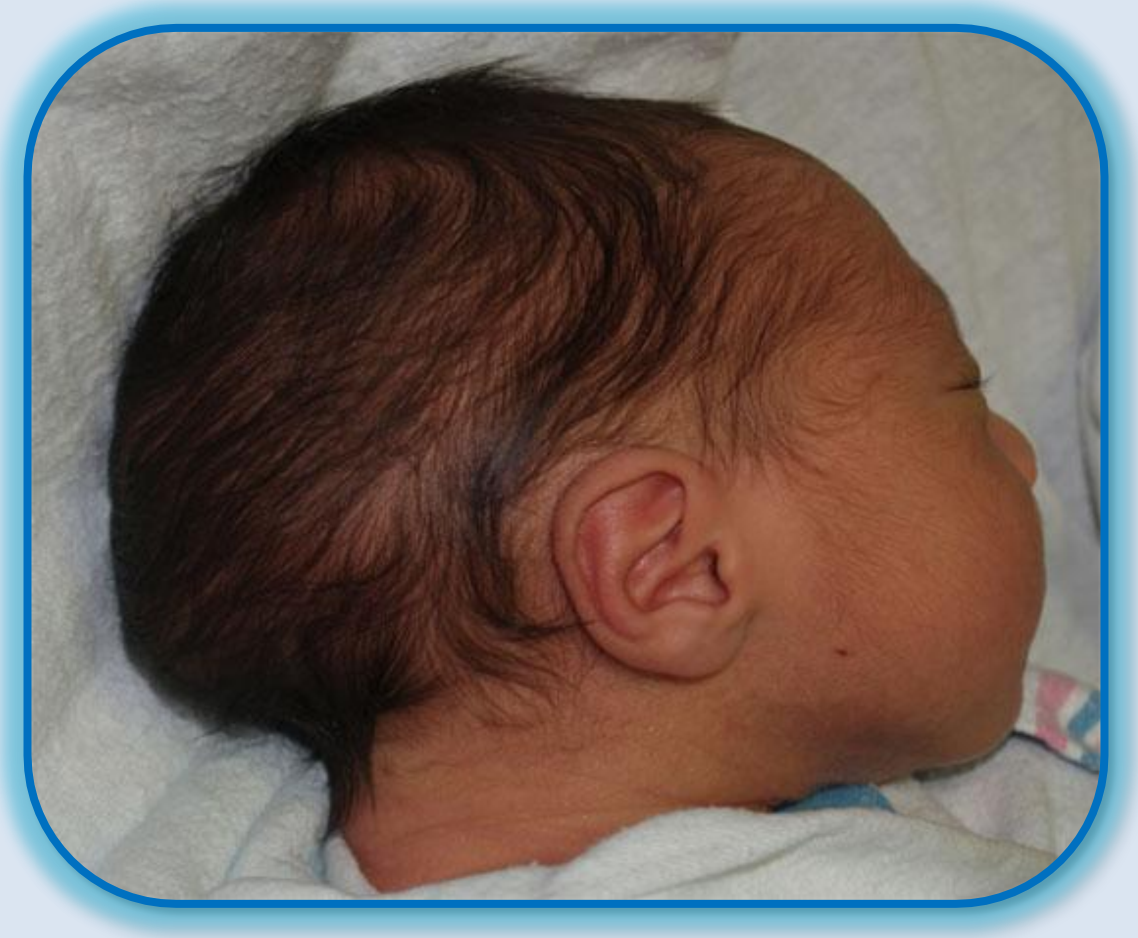
This picture shows what is usually noted primarily on **palpation**: the **ridges** that develop when one bone slightly overlaps the adjacent one during delivery. These **over-riding sutures** are part of molding. **Complete resolution** is expected with time.

Breech Molding



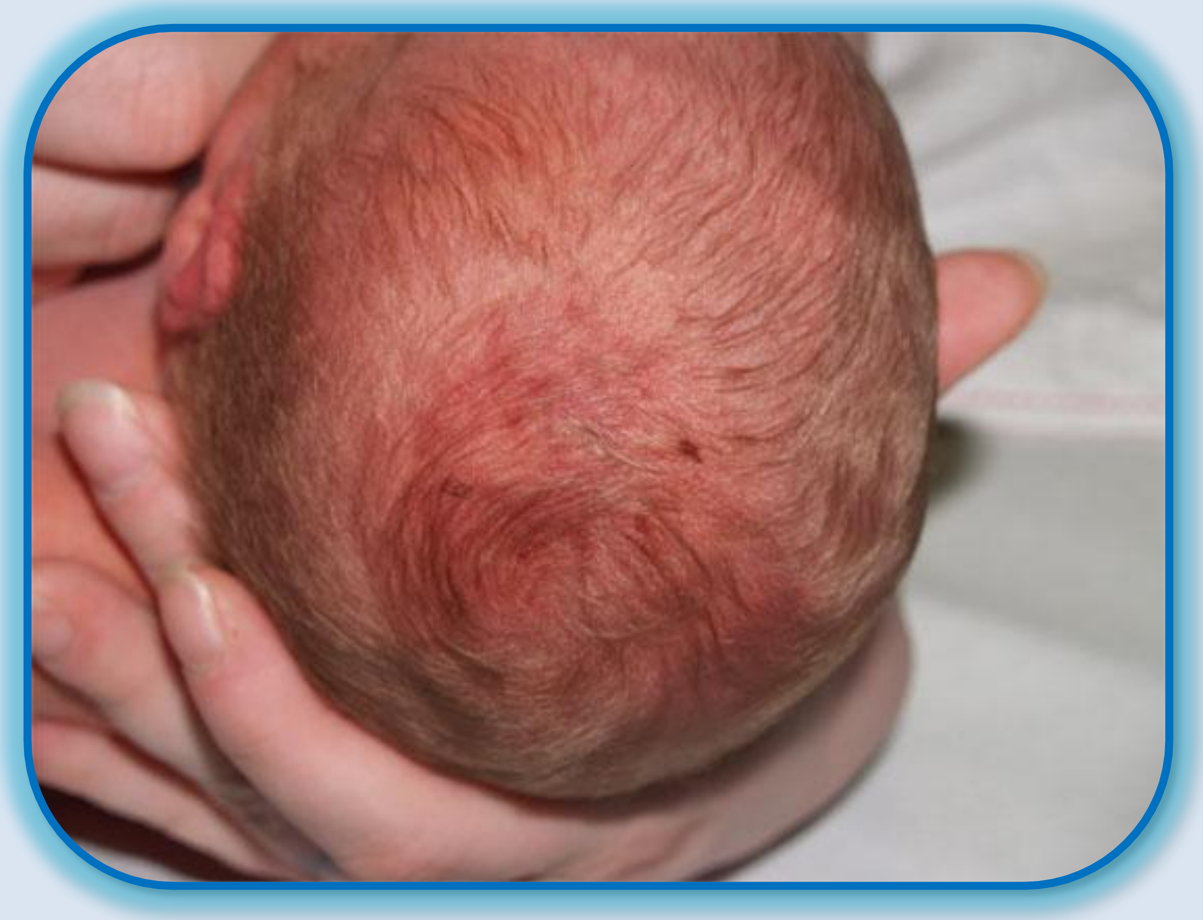
With breech positioning in utero, the head is in a position against the uterine fundus. This gives the newborn head molding that is flat on the top and elongated in AP diameter. As with any molding, this appearance will be **improved** significantly over the next **few days**.

Breech Molding



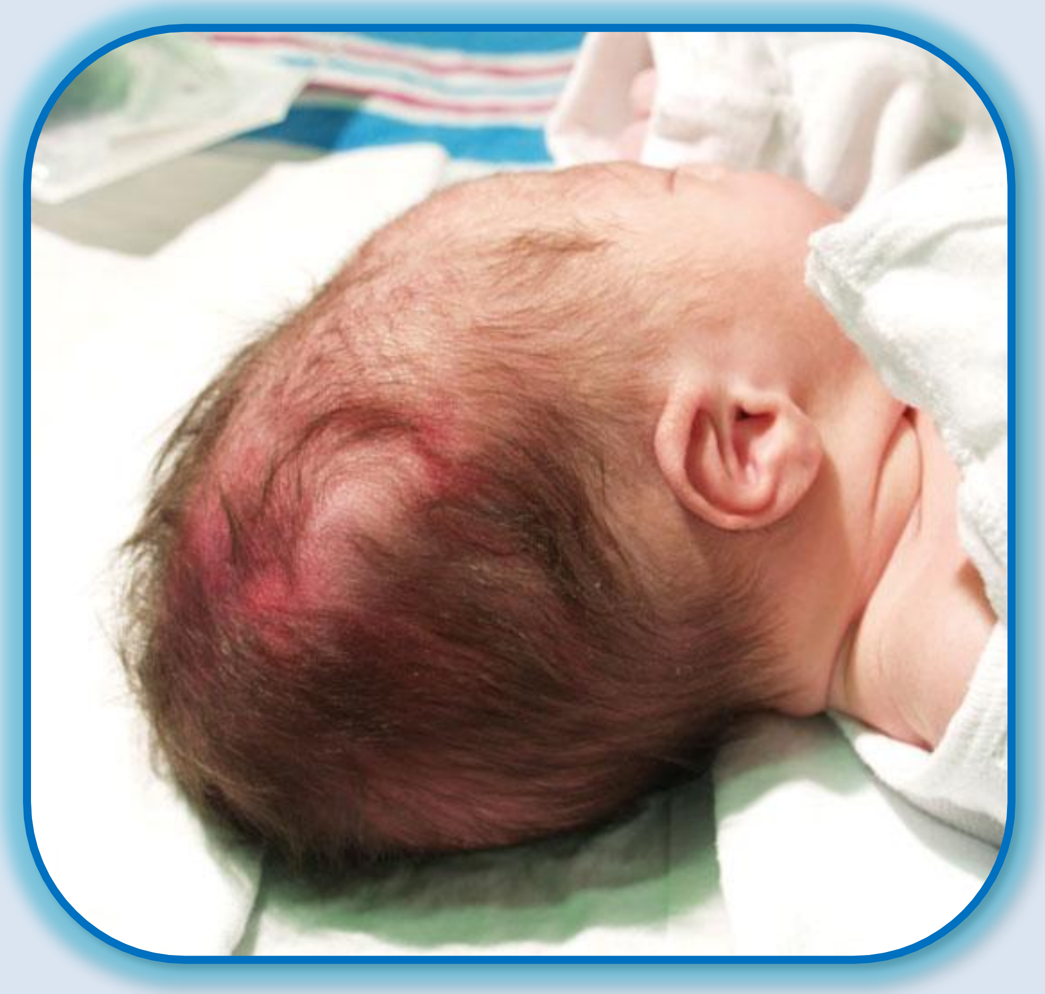
This is another example of the head molding that results when the infant has been in the breech position in utero. In this baby, the prominence of the occiput is particularly noticeable, but is not a cause for concern. Again, **spontaneous resolution** is expected.

Bruising



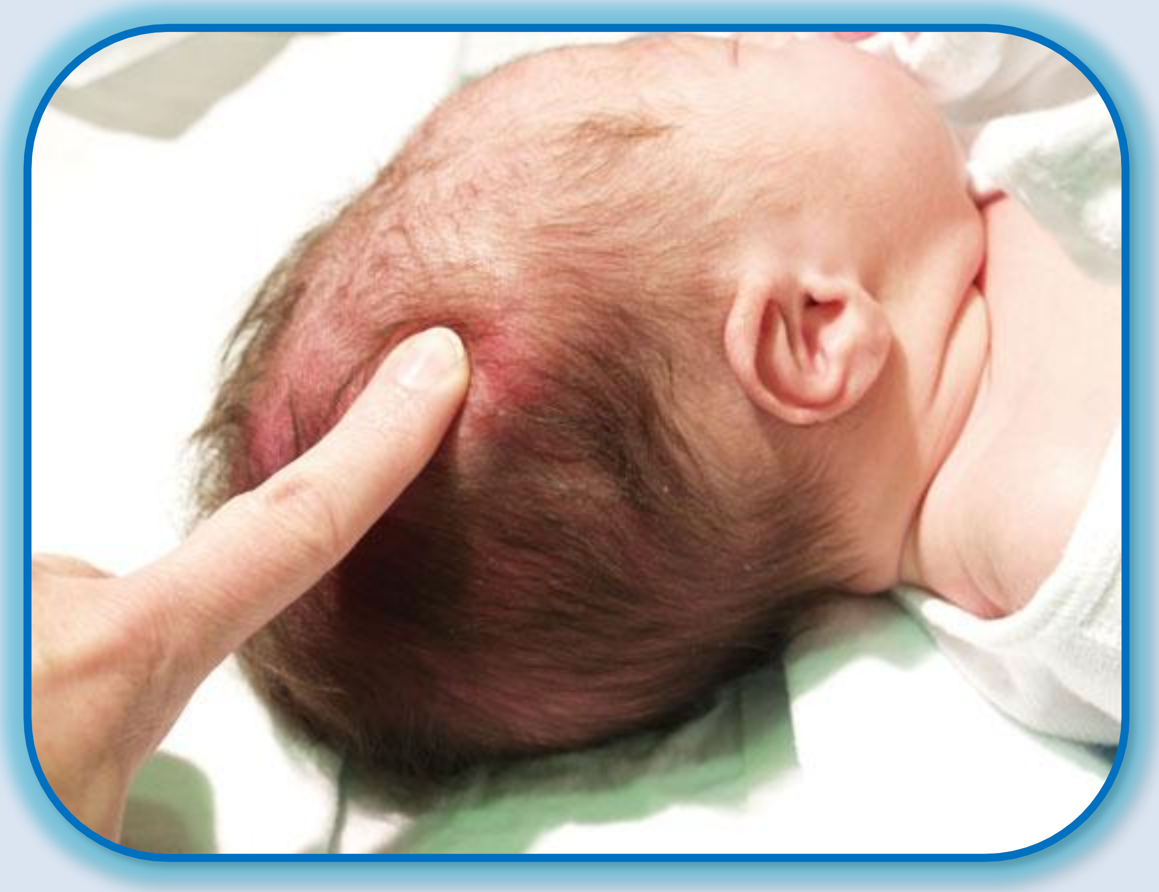
Bruising of the vertex of the head is a fairly **common** finding in newborns. The affected area may be rather large and may have various shades of red and blue. In some cases, traumatic blisters or bullae may be present. If a scalp electrode was used during delivery, a small scab is often visible is this area as well. **No treatment is required**.

Caput Succedaneum



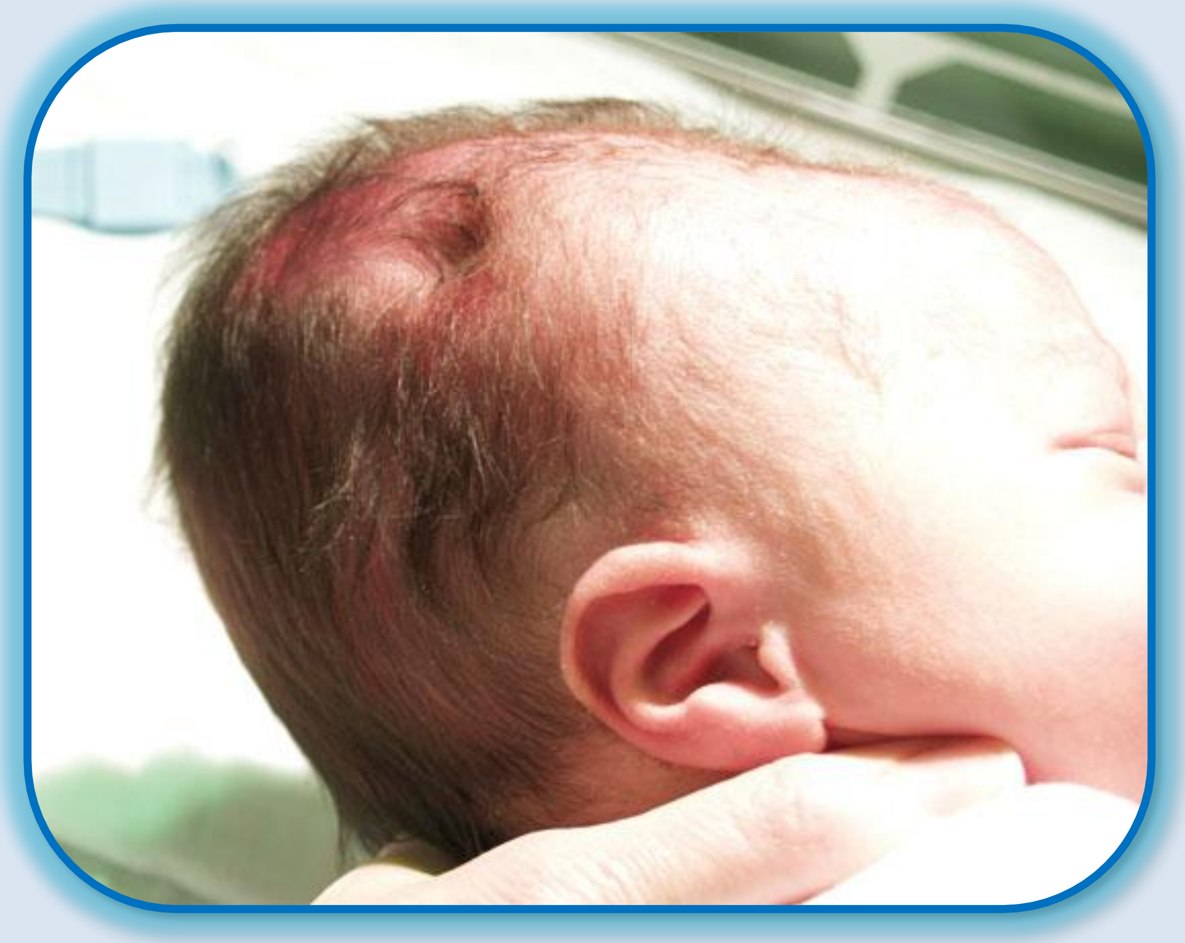
This photo was taken on the first day of life. There is some molding present here, but much of what is frequently mistaken for molding is caput **(scalp edema)**.

Caput Succedaneum



Firm, constant pressure in one spot is the easiest way to elicit the characteristic **pitting edema** of caput.

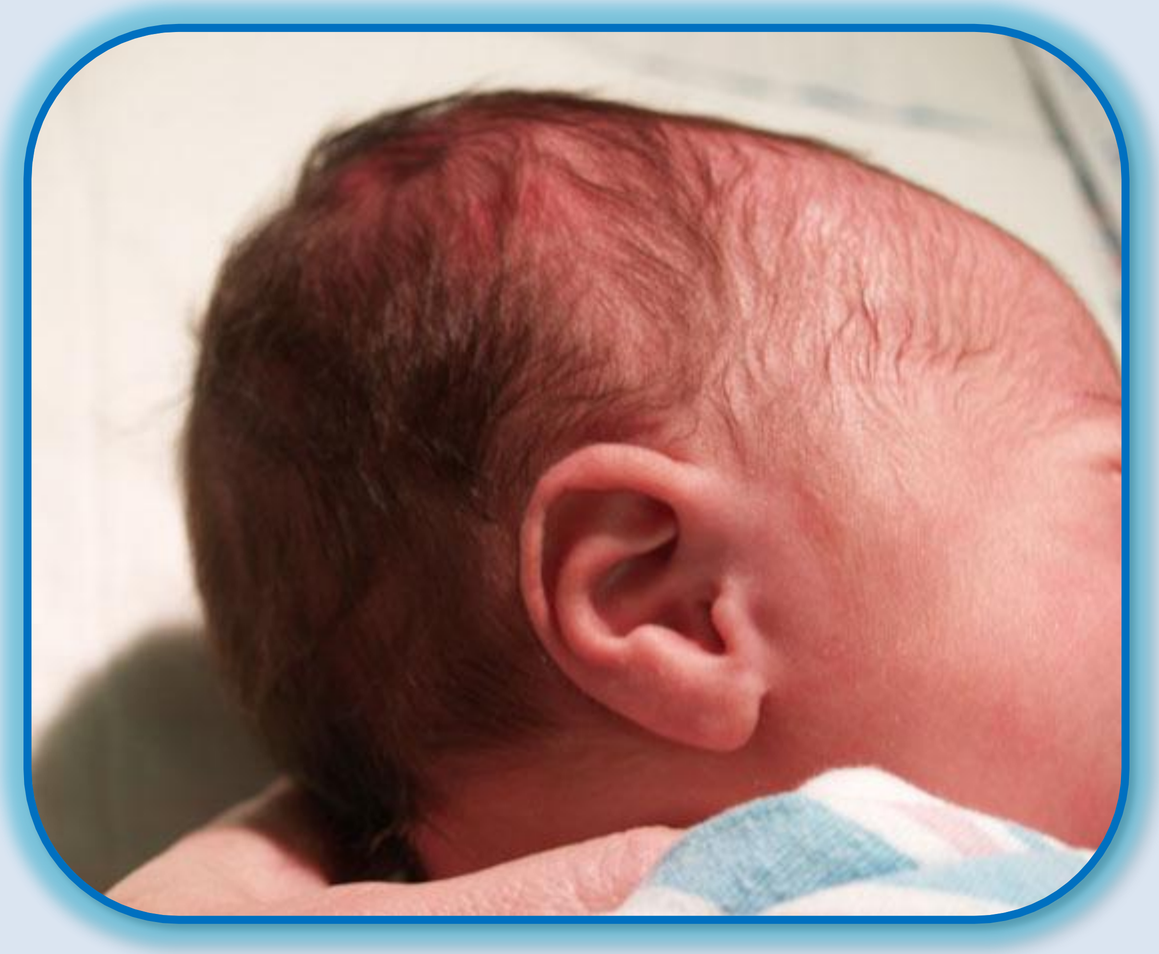
Caput Succedaneum



After the pressure is released, the pitting indentation is clearly seen. Although **caput can cross over suture lines**, it is often **predominantly unilateral**.

Evaluating for pitting edema is a much more useful diagnostic tool than location.

Caput Succedaneum

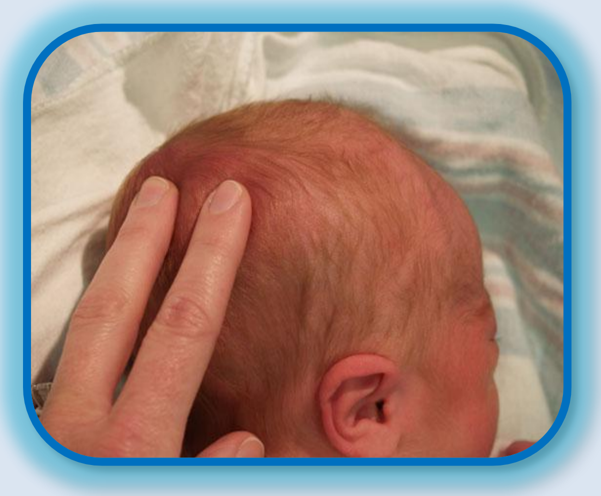


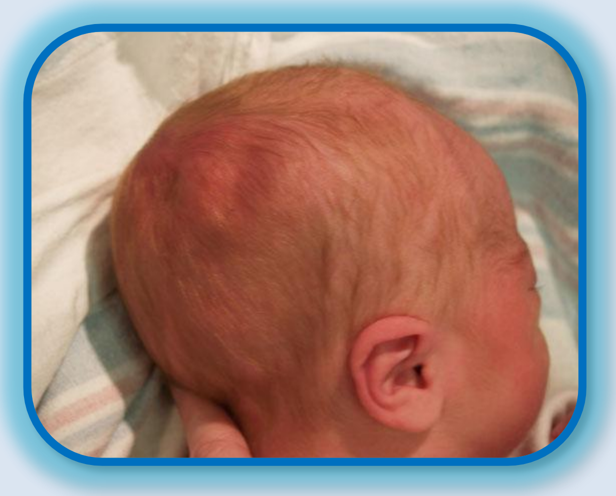
The following day, caput is much less prominent. This is consistent with the natural course of caput (**maximal at birth, with rapid resolution** over the next 24 - 48 hours).

Caput Succedaneum

A second infant, few hours after birth. Caput is not easily visualized in this photograph, but can be appreciated on exam.

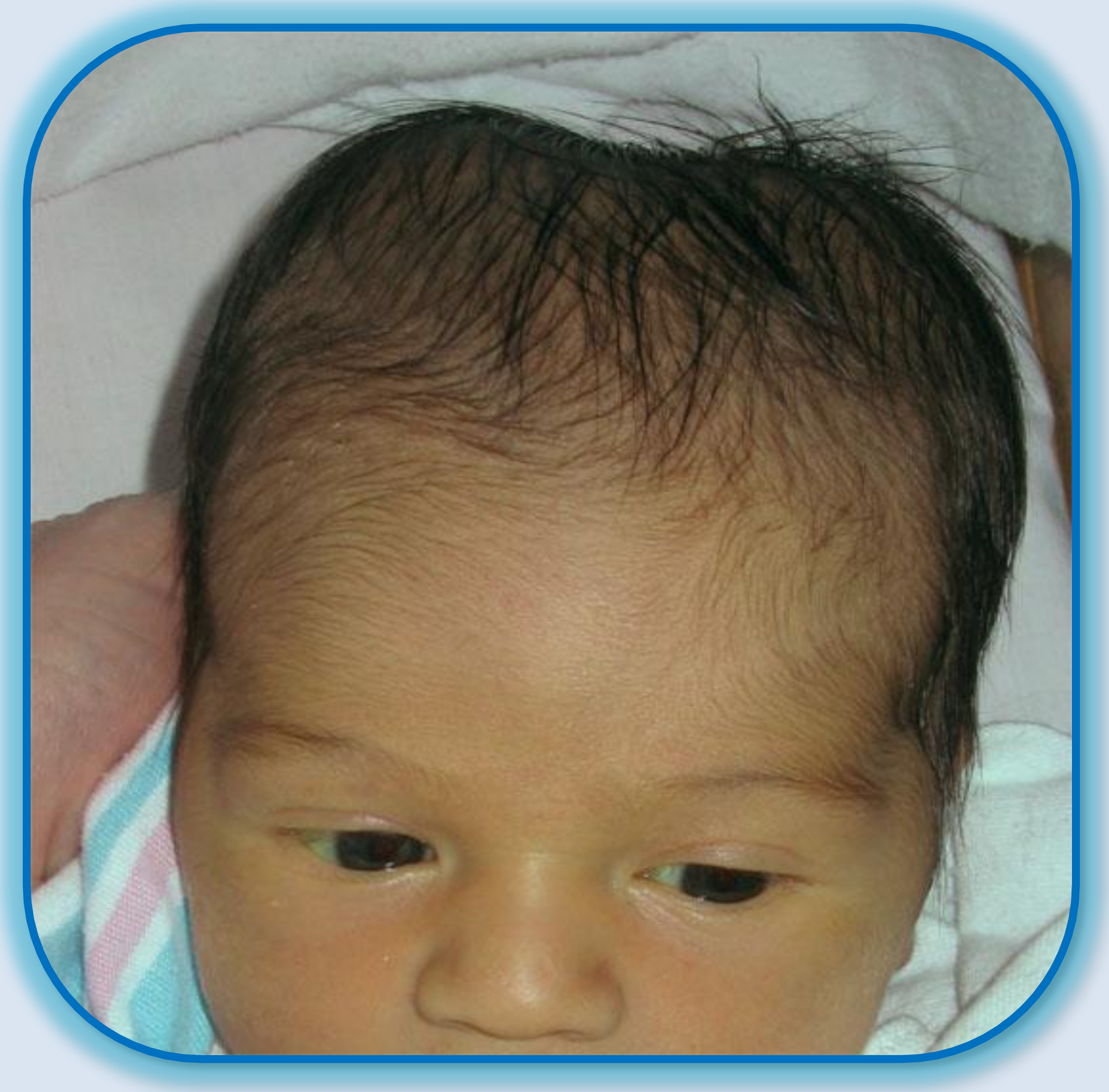
Caput Succedaneum





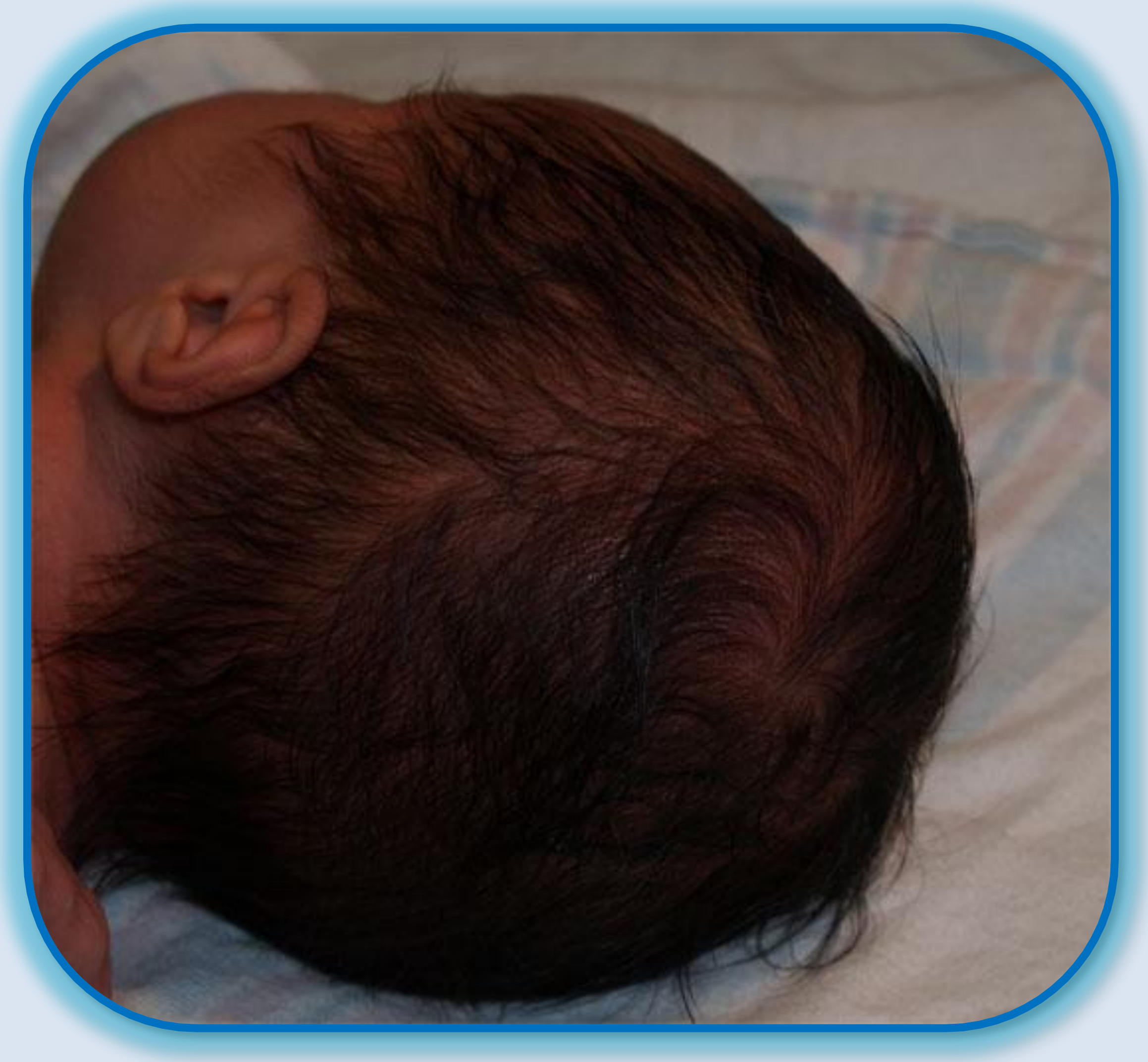
With firm pressure, the extent of the caput is starting to be appreciated. When pressure is removed, the two indentations are visible. By the next morning, the edema had completely resolved.

Cephalhematoma



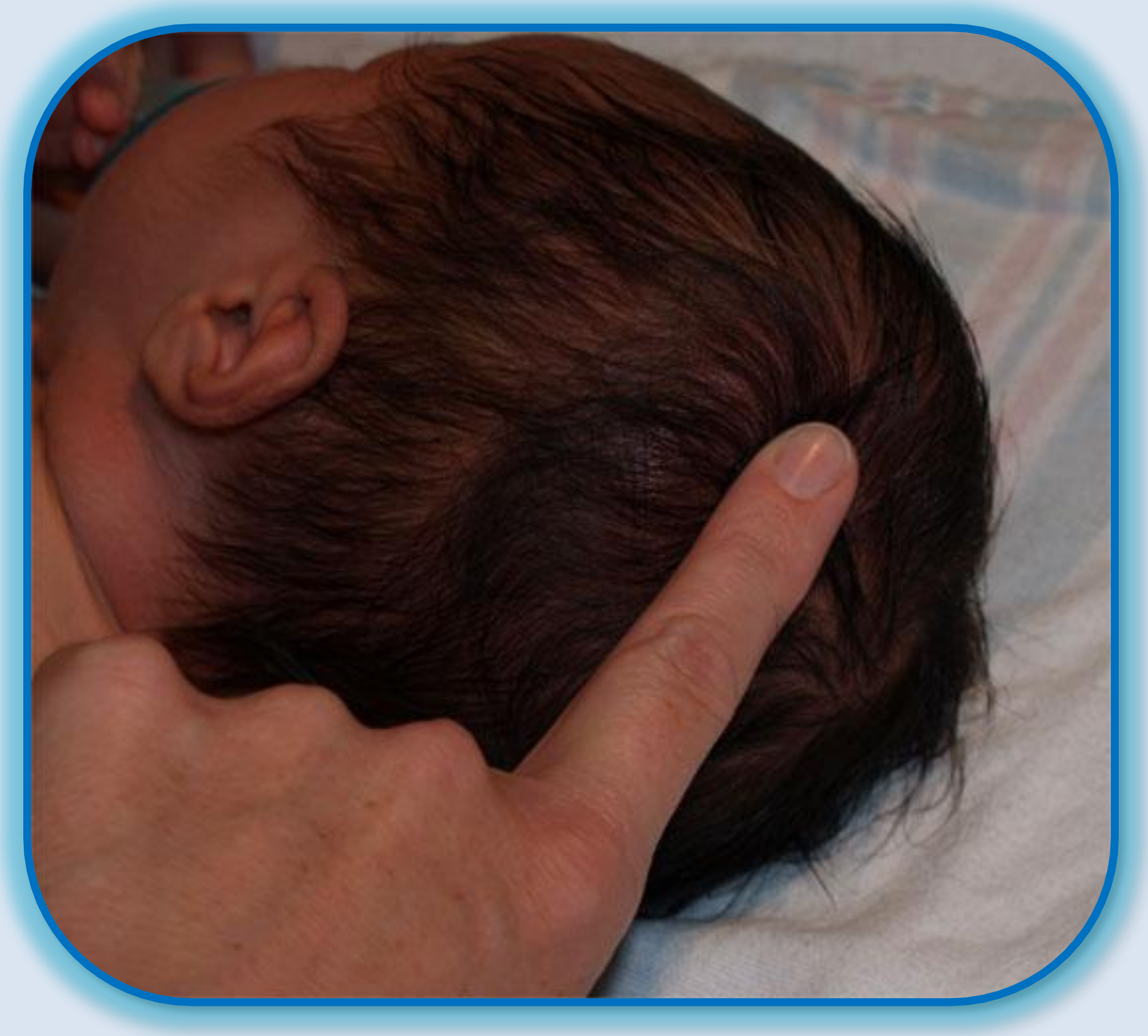
Cephalhematoma is a **collection of blood under the periosteum** of a skull bone. Because of its location, **it is impossible for cephalohematoma to cross suture lines**. If more than one bone is affected, there will be a separation between the two areas at the suture line as seen in this photo (the sagittal suture separates the bilateral parietal cephalhematomas). On palpation, these areas feel **fluctuant**. A ting of **jaundice** can be seen in eyes.

Cephalohematoma



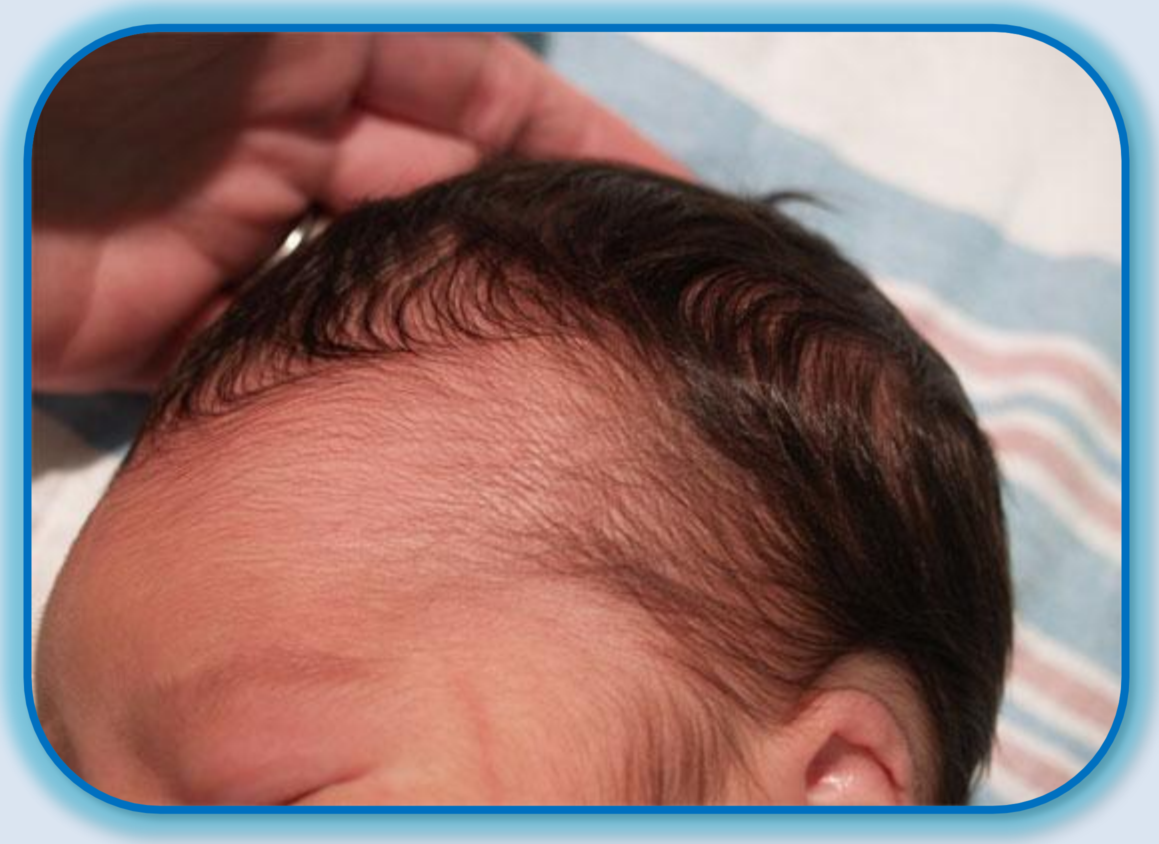
In this infant the fluctuence on physical exam is striking, even though the visual appearance is not significantly deviated from normal.

Cephalohematoma



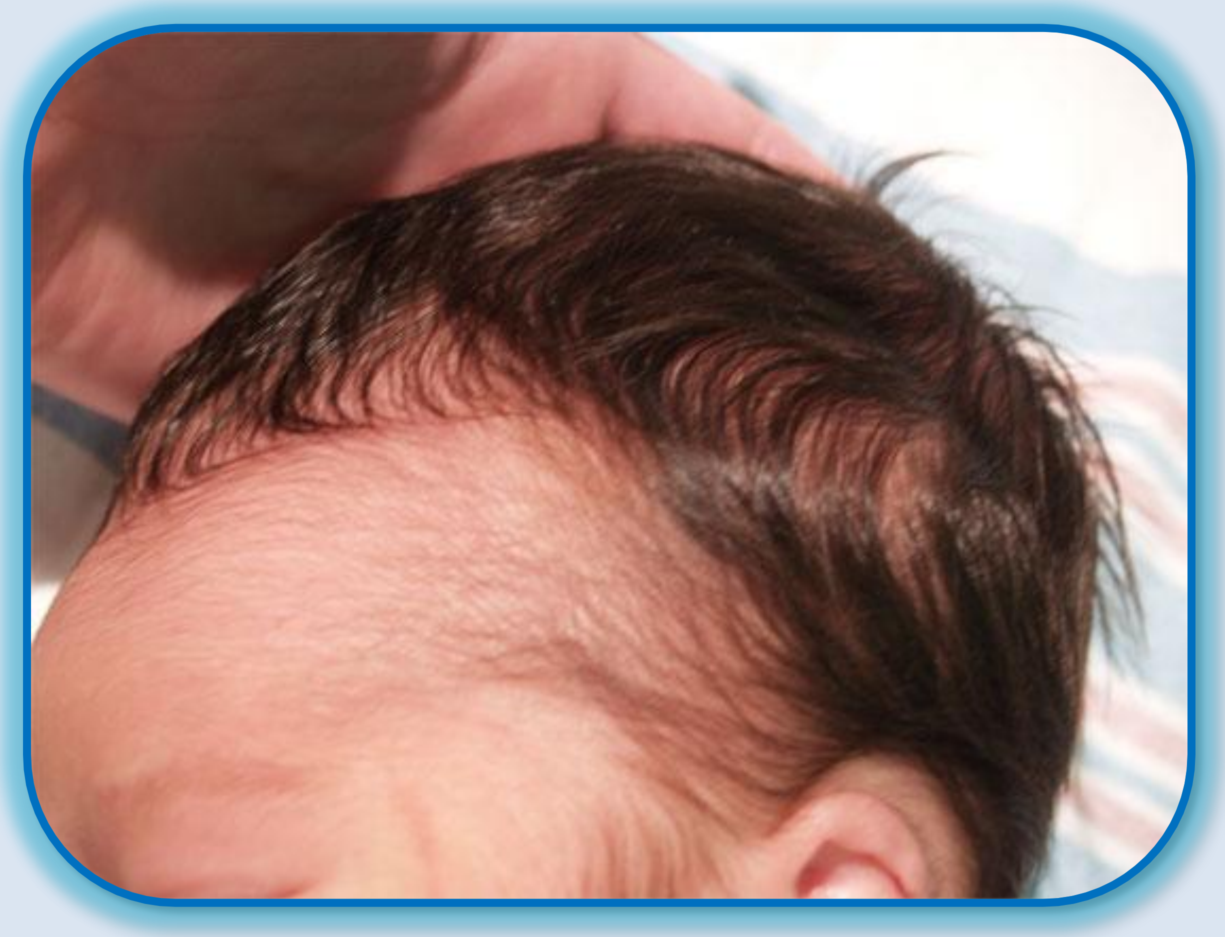
When digital pressure is applied, the fullness shifts from under the finger to the surrounding areas. When pressure is released, blood immediately refills this area and the appearance **(unlike caput)** is identical to the way it was before. In this baby, blood was ballotable across most of the left parietal bone. As with all cephalohematomas, it was **limited by the suture lines**.

Subgaleal Bleed



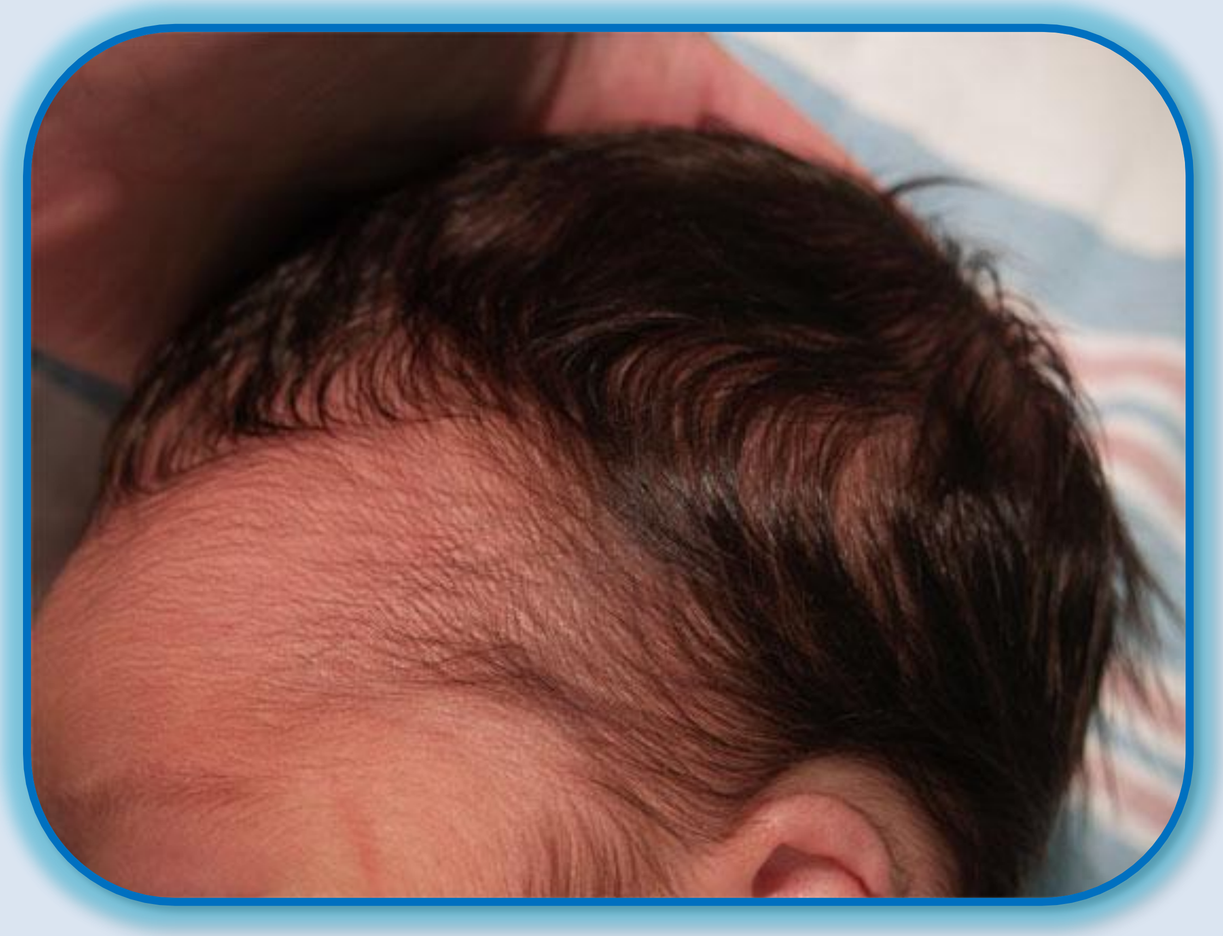
The subgaleal area is a large potential space, so when bleeding occurs there, it **easily moves to the dependent part of the head**. Because of the size of the space, exsanguinations of the baby's entire circulating blood volume into the subglaeal space is a possibility if active bleeding continues.

Subgaleal Bleed



The same baby's in the previous photo, but here pressure is being applied with the palm and fingers to squeeze the blood that was in a dependent location into a more visible, anterior location. The sensation is similar to that of handling a water balloon. It is a very **fluctuant, shifting** mass without discernible limitations.

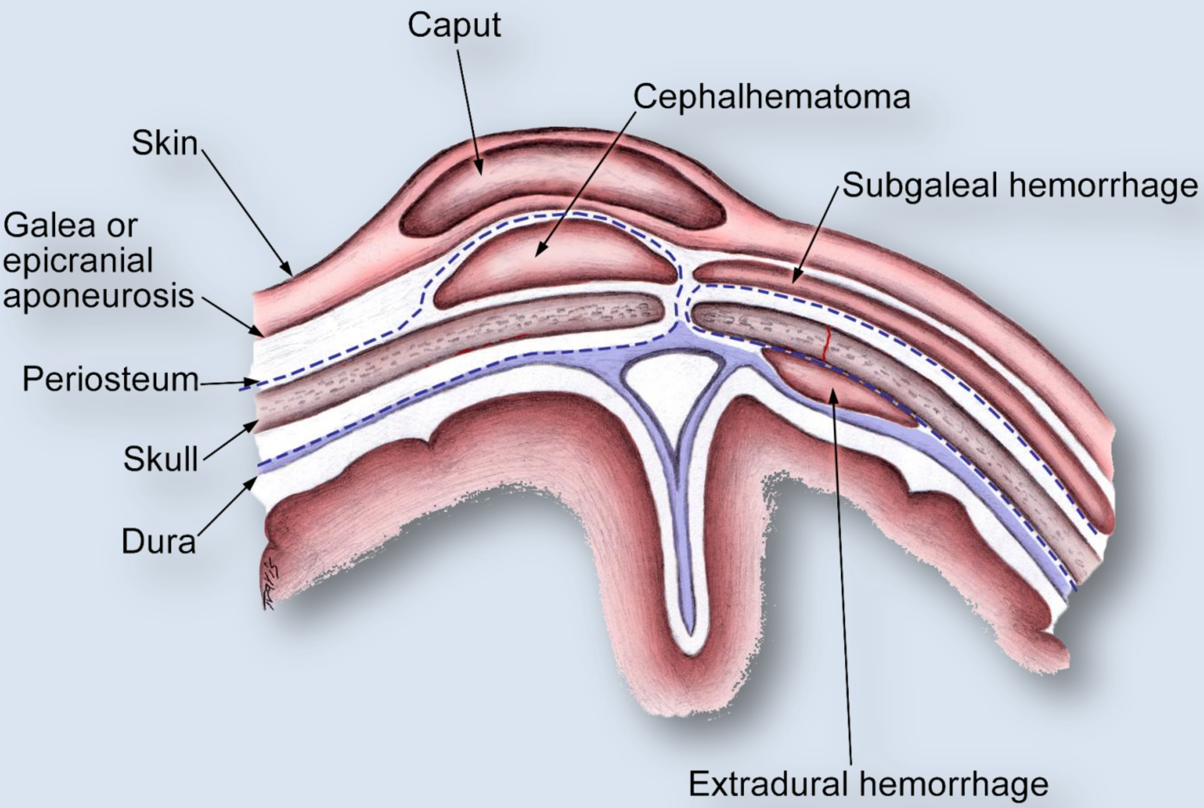
Subgaleal Bleed



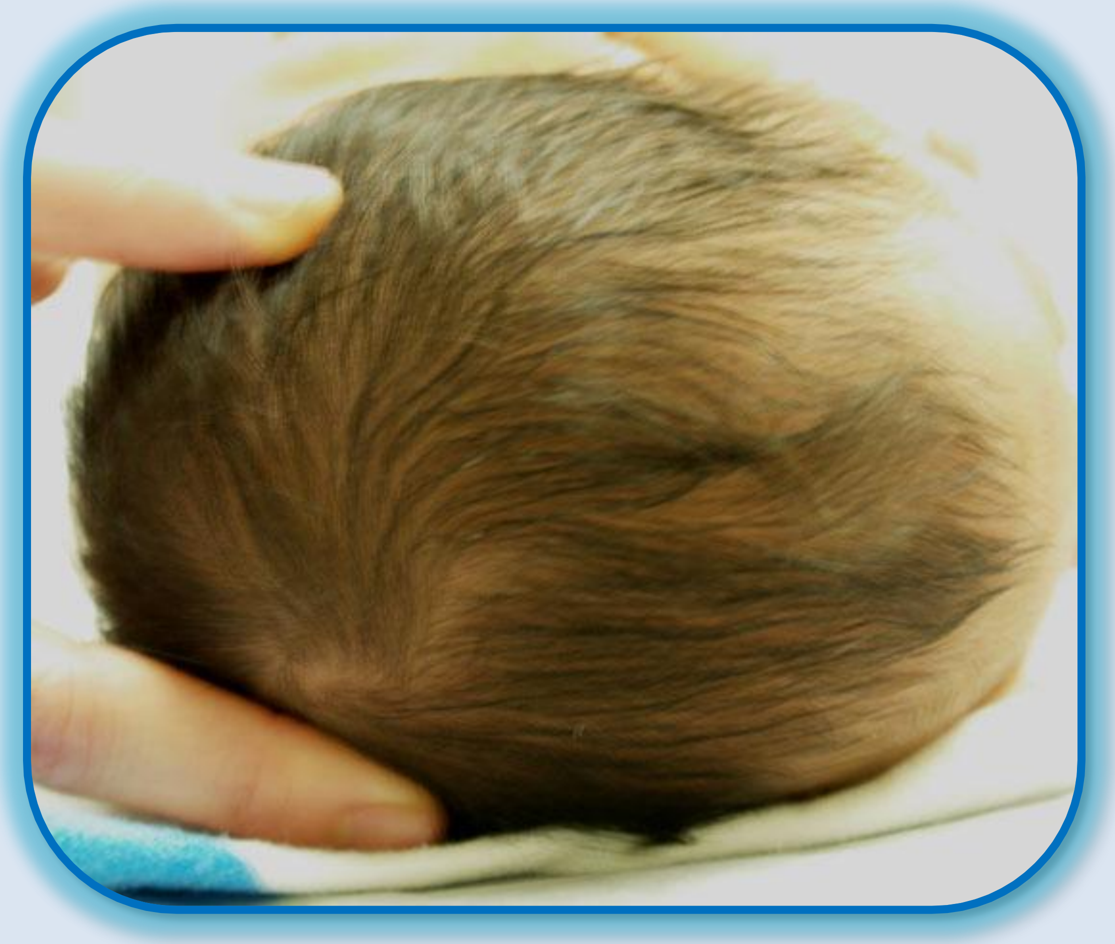
The same baby, as the fluid is pushed anteriorly, an even larger bulge can be seen over the baby's left parietal area and anterior fontanel.

This infant did very well. Serial hematocrits and frequent vitals were stable and a NICU consultation was requested. At the time of discharge, 4 days later, the fluctuant area was significantly smaller.

Difference between Caput Succedaneum and Cephalhematoma

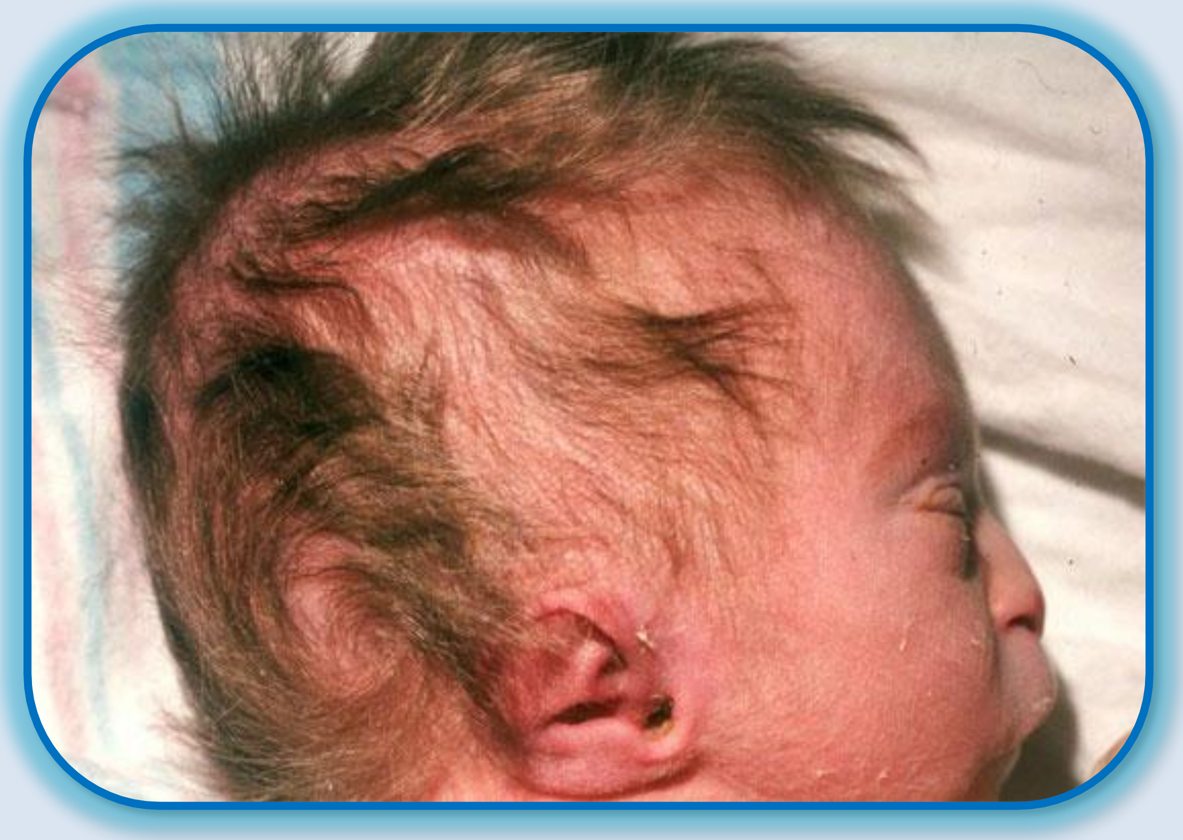


Lacunar Skull



This infant had **craniotabes** to such a degree that the area between the two fingers seemed as if it were a giant fontanel. On imaging, bone was present in this area, and a diagnosis of lacunar skull (craniolacunia) was given. Although **frequently associated with Arnold-Chiari malformation or myelomeningocele**, this child was otherwise well and had a normal brain MRI. One radiographic finding associated with lacunar skull is a scalloped appearance of the skull bones.

Unusual Hair Whorls

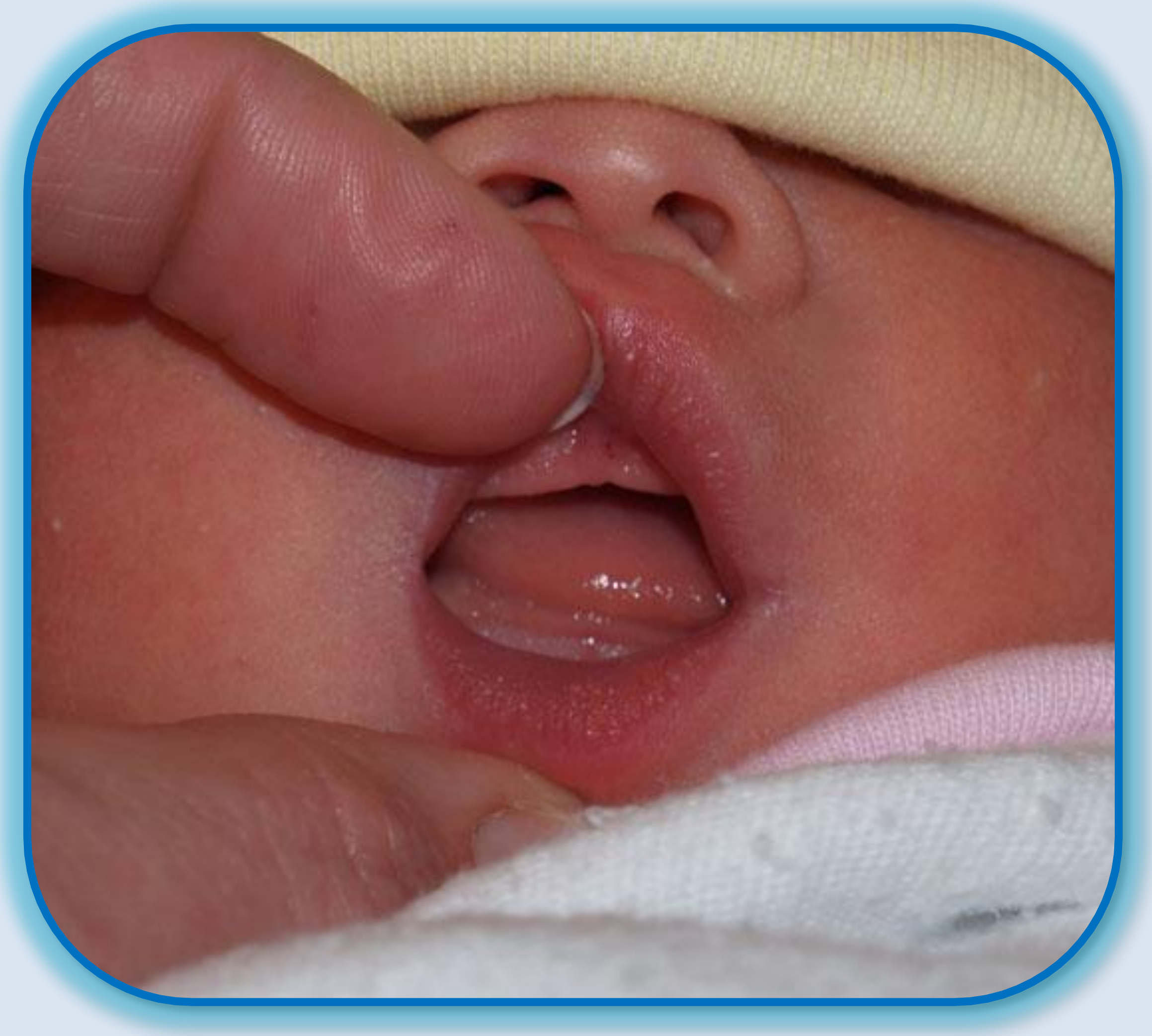


Normally, because the growth of the brain occurs in a predictable fashion, there is one primary hair whorl over the vertex of the head. **When hair whorls are multiple or in unusual locations, abnormal brain growth may be a causative factor.**

In this infant, a hair whorl can be seen behind the right ear, and the rest of the hair appears unruly, with a variety of directions of growth. **Trisomy 13 was the underlying diagnosis**.

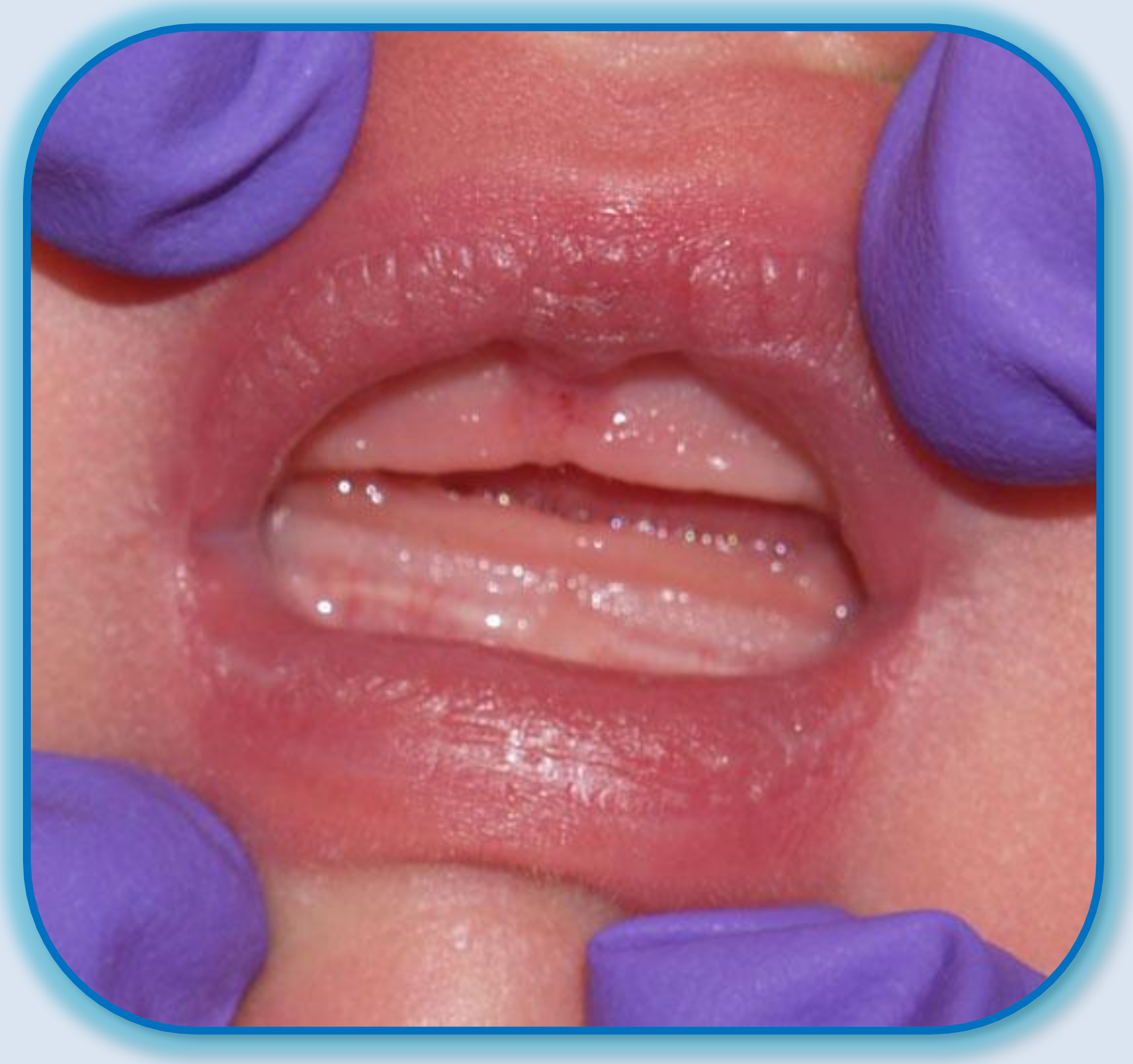
Mouth

Positional Deformity of the Jaw



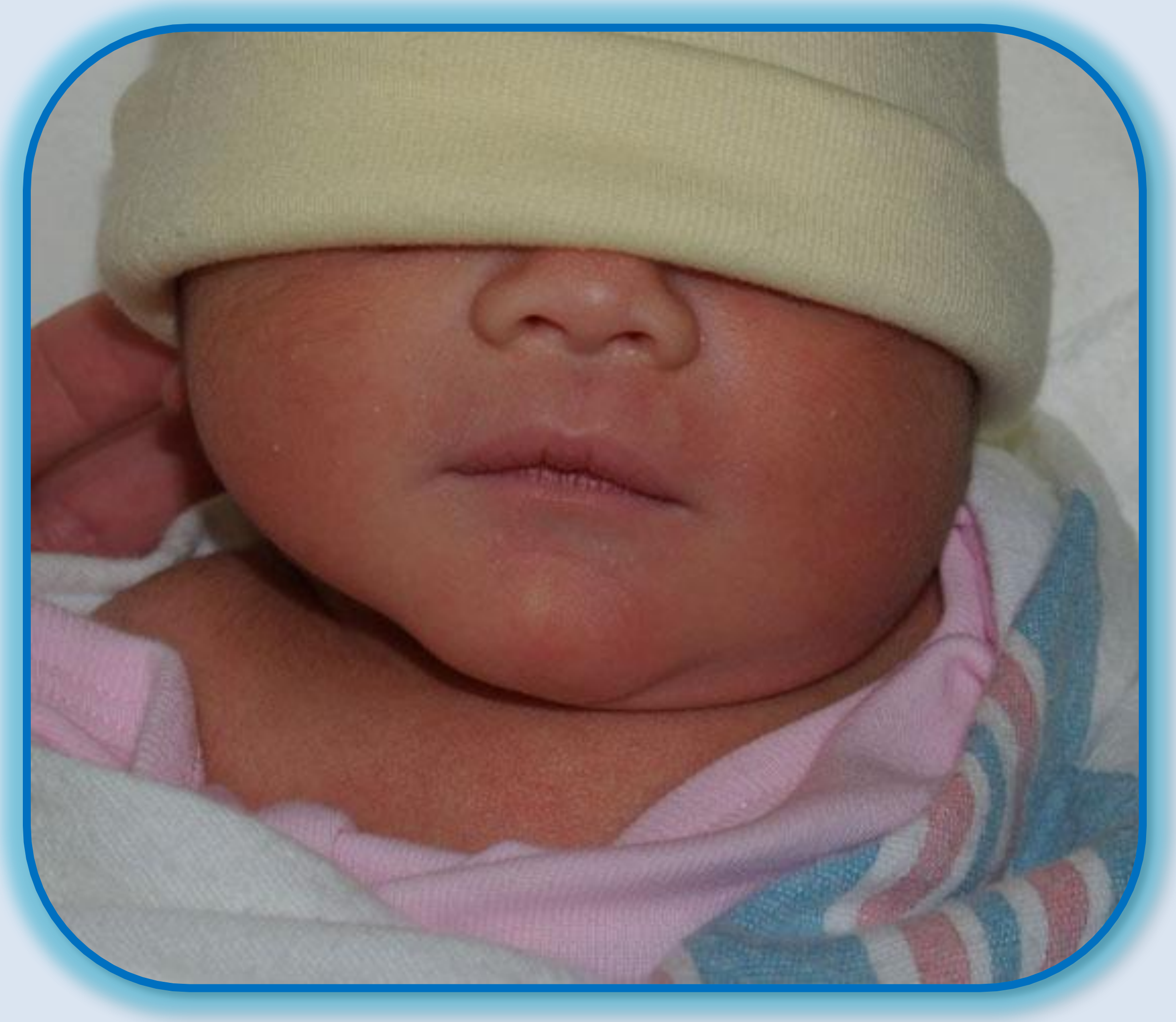
In this newborn, the gums are not parallel with each other. This is due to **in utero molding**, when the head has been turned to one side and the chin has been pushed up against the shoulder for some time. The angle is usually mild, but in some cases, it can be pronounced enough that the jaw sublaxes with opening. **Spontaneous resolution** is expected.

Positional Deformity of the Jaw



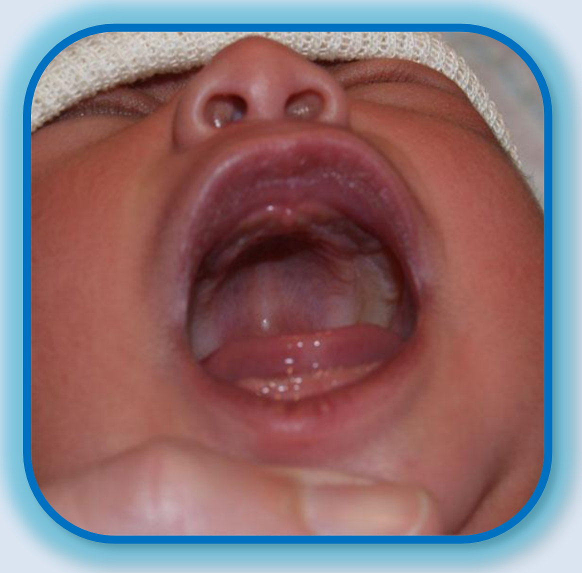
A closer view of the same infant, the angle between the upper and lower jaws can be better appreciated with the gums closer together.

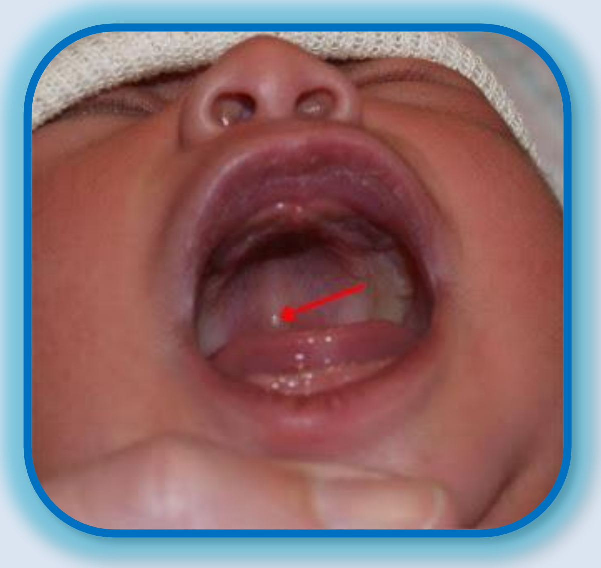
Positional Deformity of the Jaw



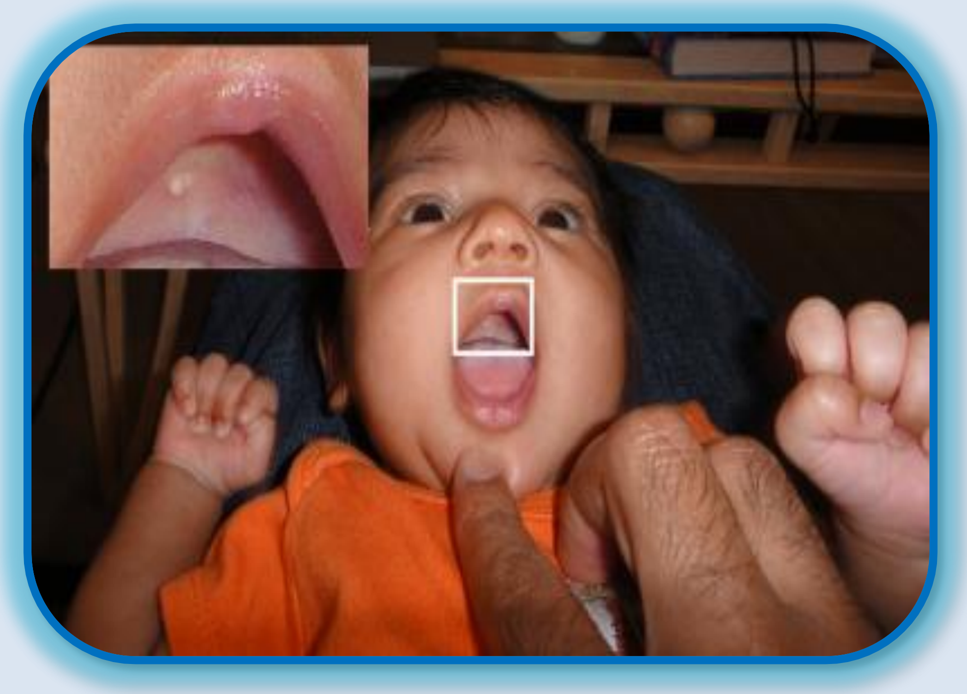
With a wider view, the **asymmetry of the chin** can be seen. The right side of the chin is more concave and fits nicely up against the right shoulder (the position in utero). In contrast, the left side of the chin appears more full.

Epstein Pearl



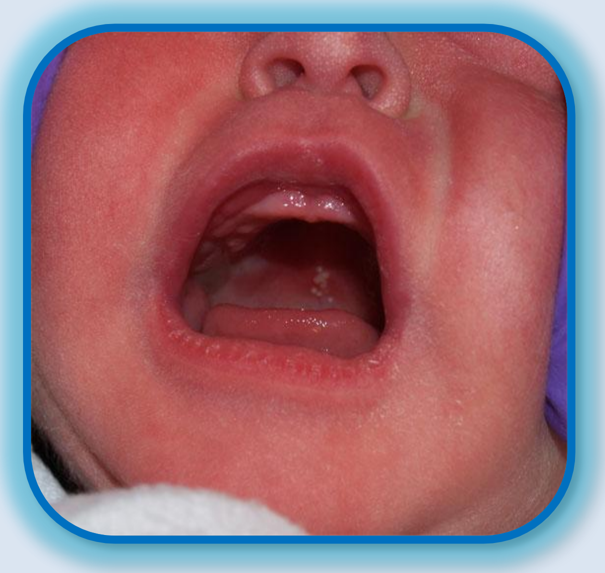


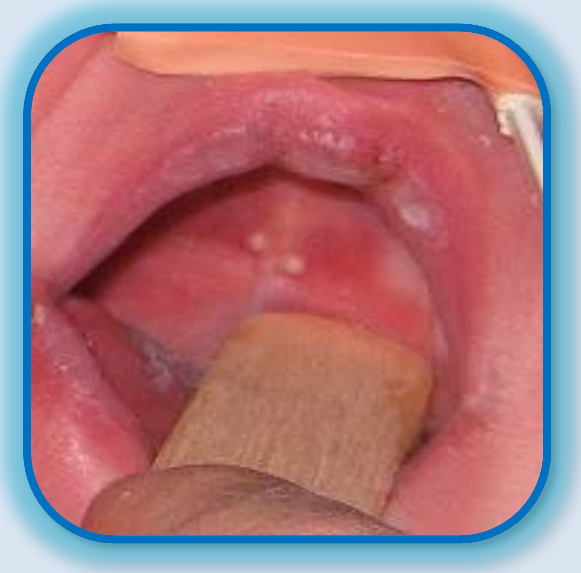
The small white papule seen in the midline of the palate of this infant is an Epstein pearl. It represents **epithelial tissue** that becomes **trapped during the palatal fusion**. It is a **very common** and **benign** finding.



Epstein Pearl in 5 week old infant

Epstein Pearl



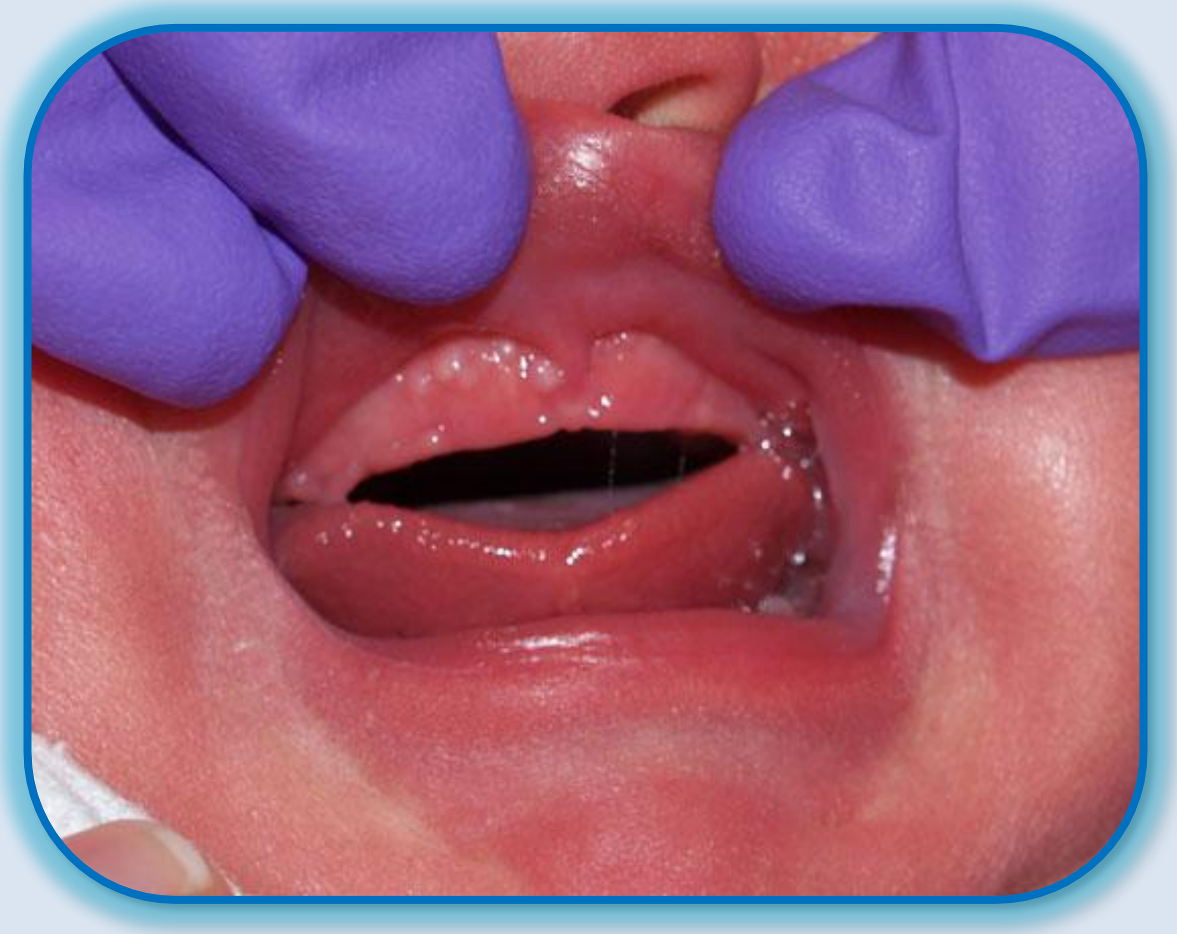


On palpation, these are **firm papules** that can be appreciated when the infant is sucking on the examiner's finger.

They do not require treatment as they **resolve spontaneously** over the first few weeks of life.

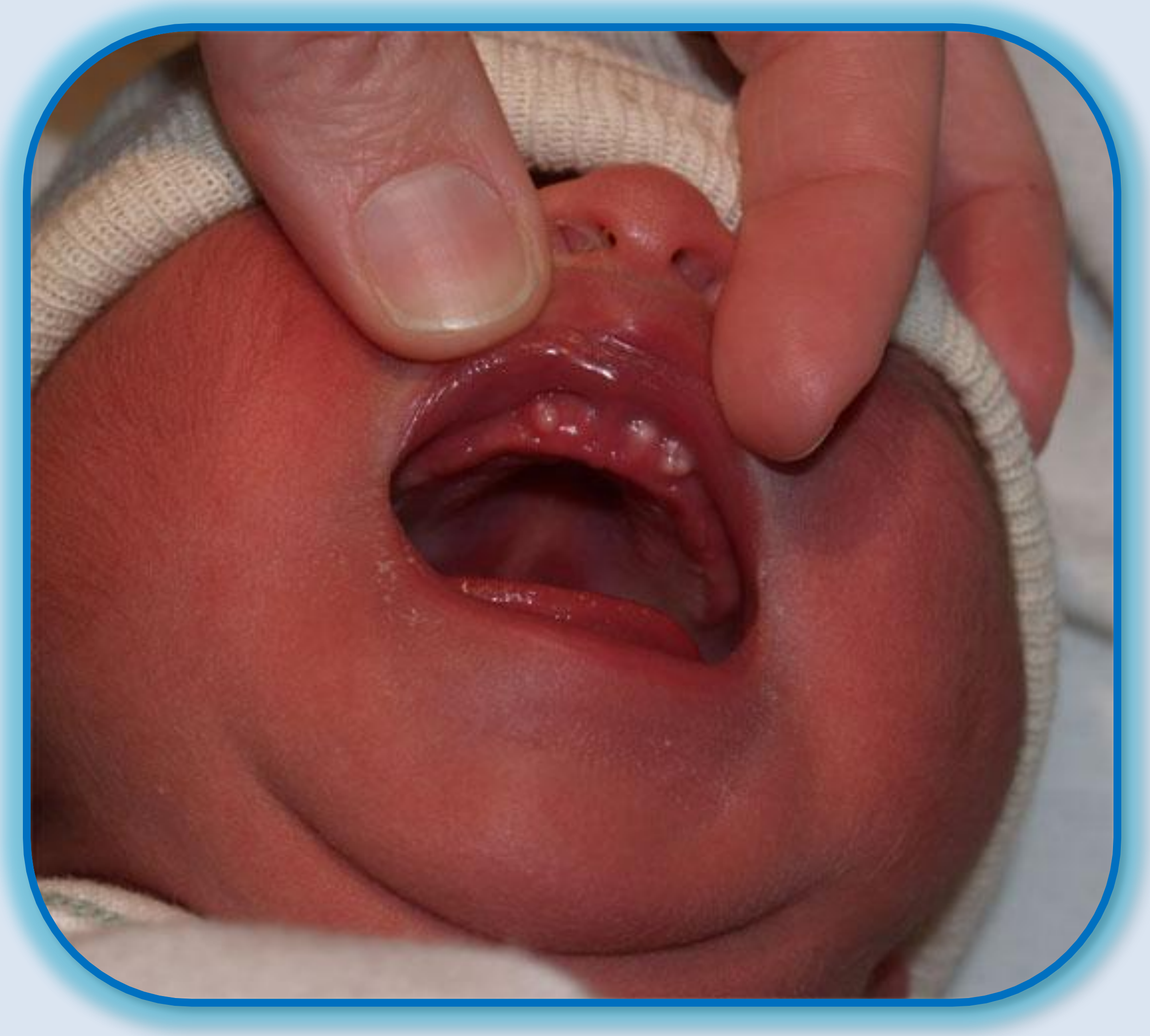
Epstein's pearls are **very common and benign** small white or yellow cystic vesicles (1 to 3 mm in size) often seen in the median palatal raphe of the mouth of newborn infants (**occur in 65-85% of newborns**).

Bohn's Nodules



The **white bumps** present on the upper gum in this infant are Bohn's nodules. The exact **etiology is unknown**, but they are thought to arise from remnants of the dental lamina or from heterotrophic salivary glands. Present either on the lateral aspect of the gum or on the periphery of the palate, these nodules are a **benign** finding and will disappear with time.

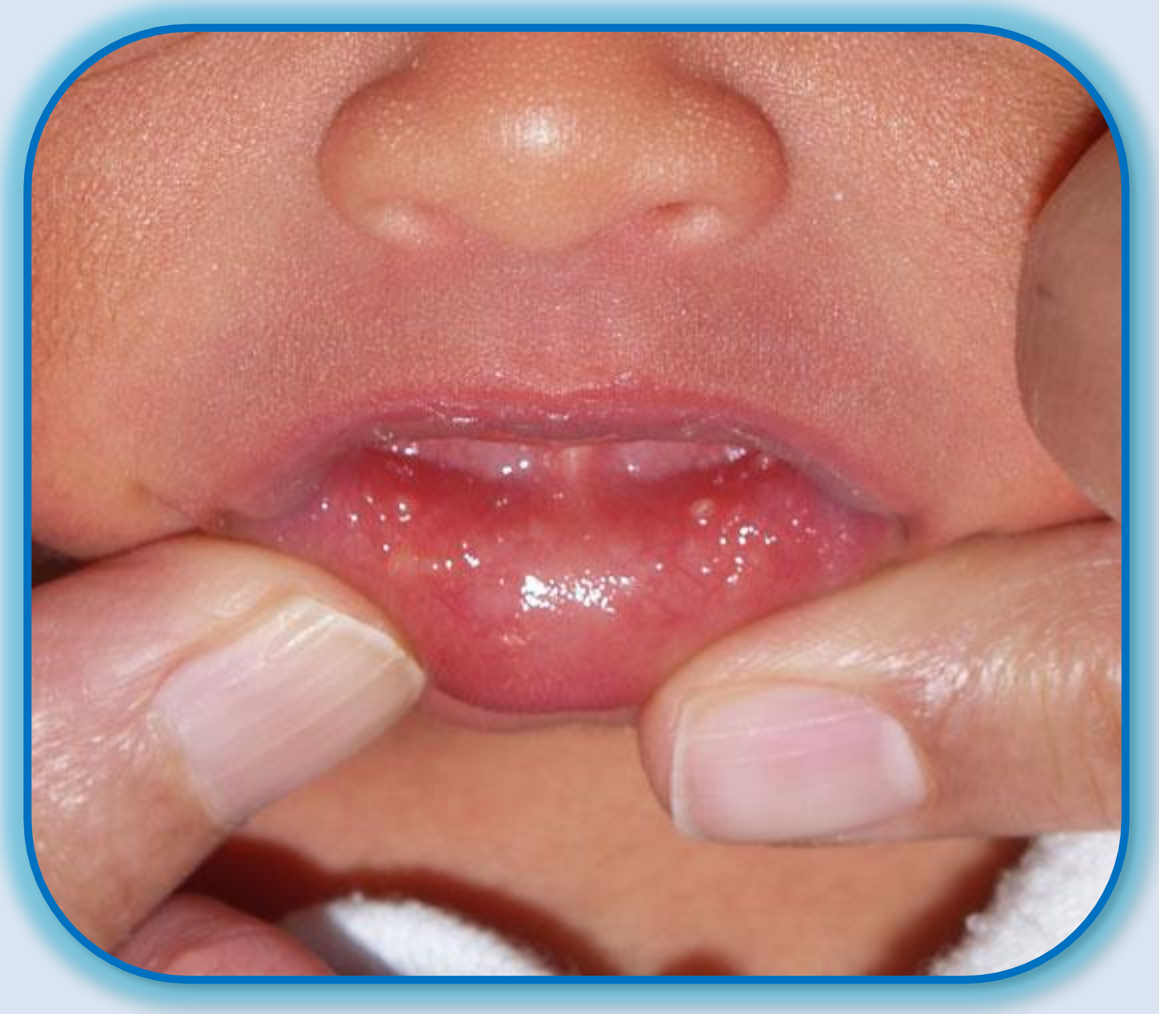
Bohn's Nodules



Here is another infant with the same finding. When the nodules are large, they are sometimes **mistaken for teeth**, but the position on the exterior surface of the upper gum is inconsistent with teeth.

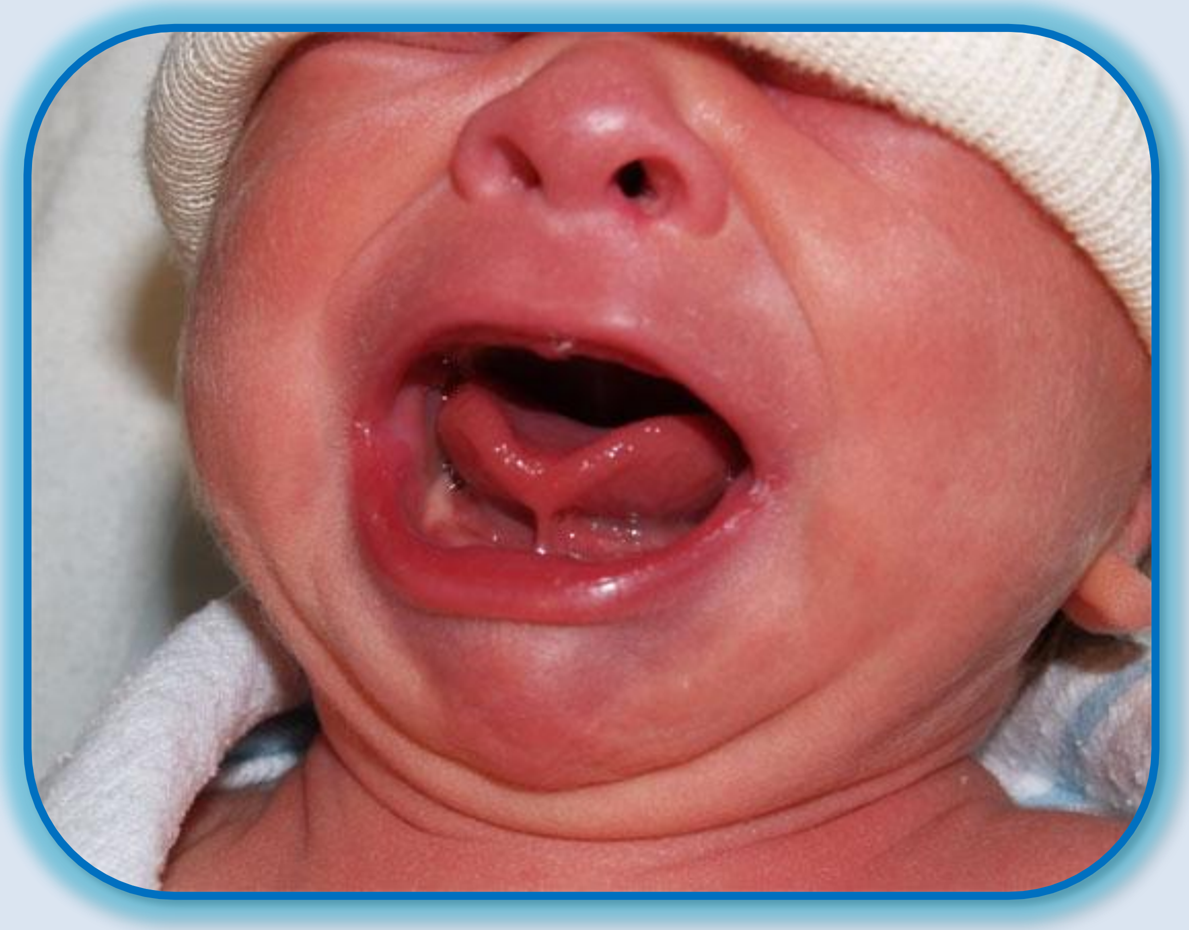
When natal teeth occur, they erupt from the alveolar ridge, and typically occur in the mandibular gum.

Salivary Glands



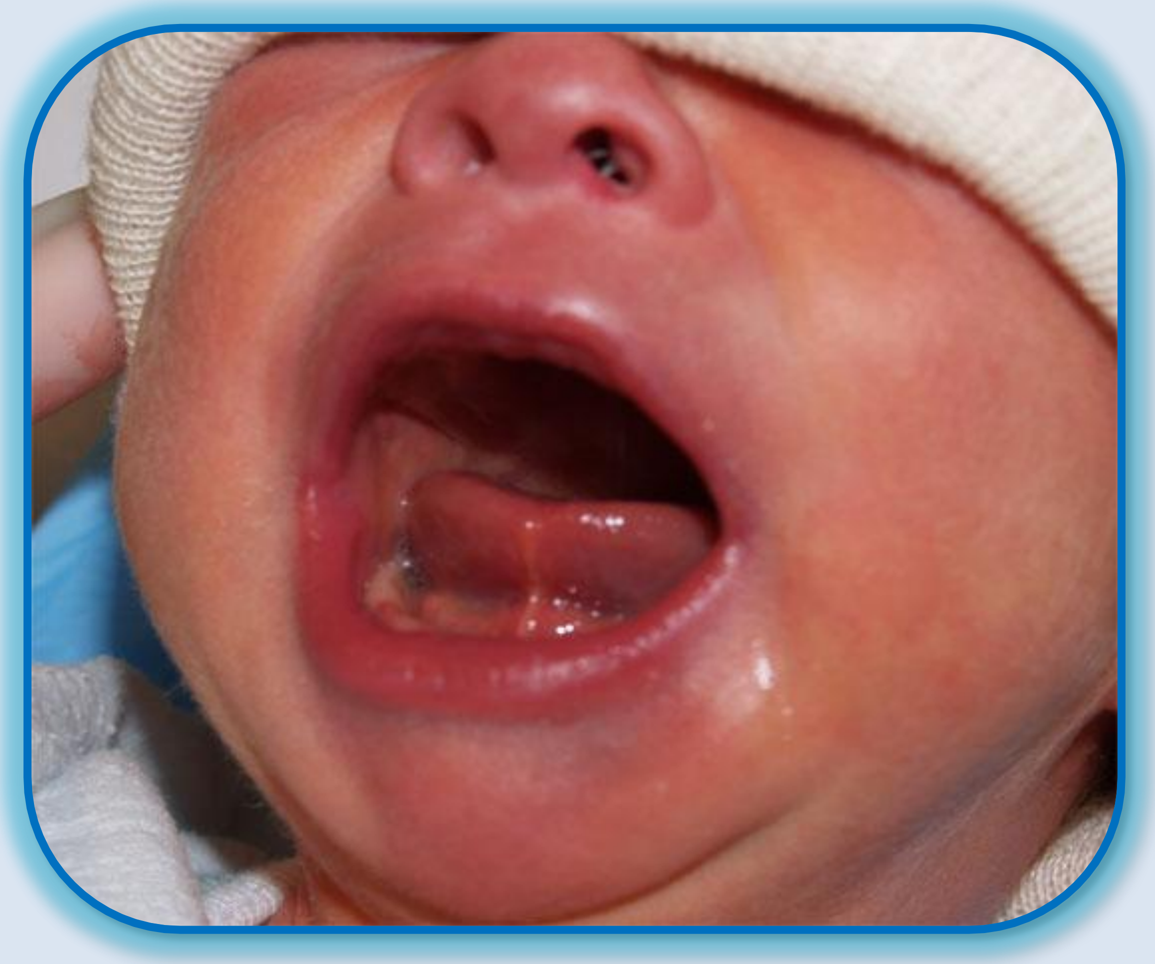
These vesicular-looking lesions were first noted by the mother as she was getting the baby latched on for feeding. These are minor salivary glands that are just more prominent than usual. **No evaluation is needed**.

Ankyloglossia



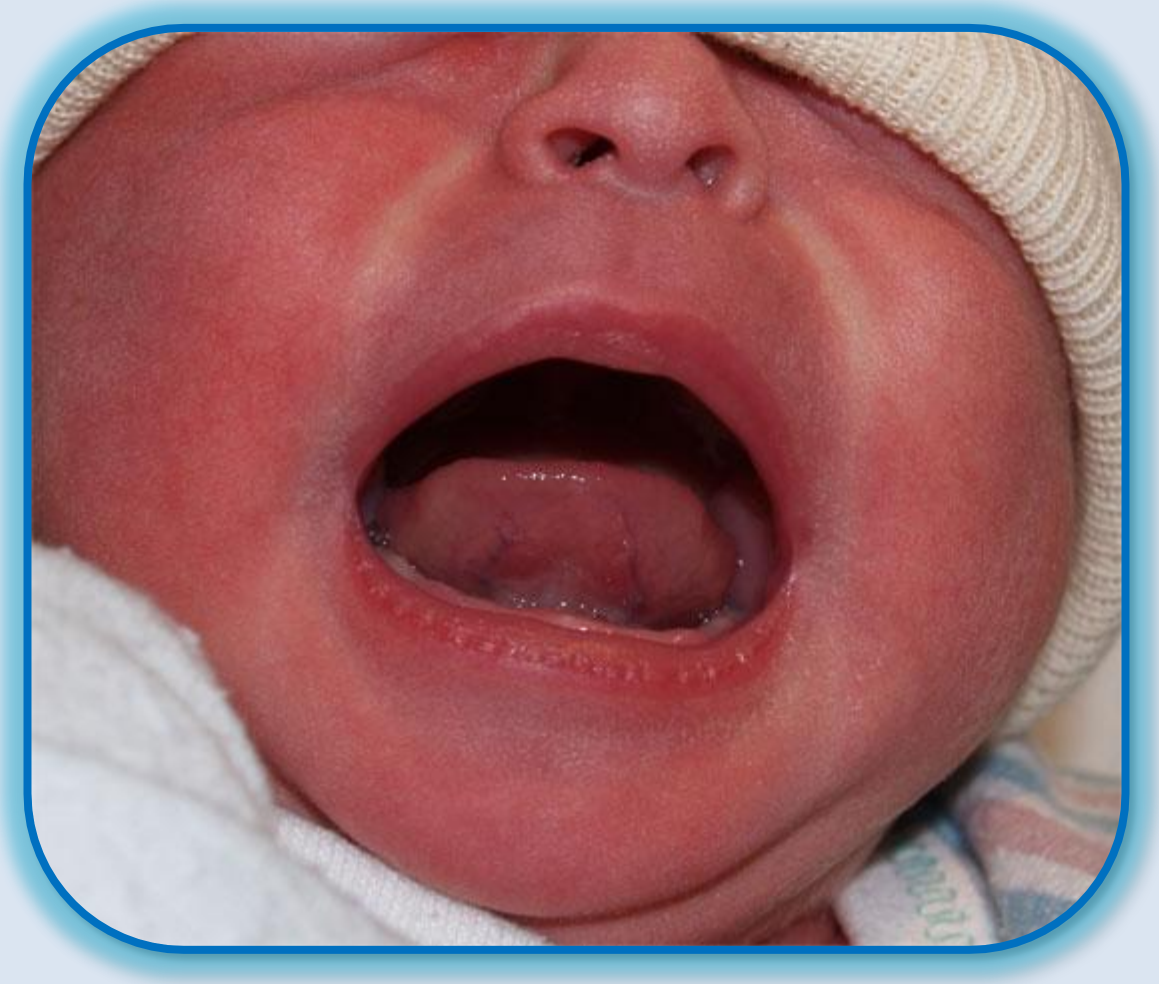
Tongue-tie occurs in approximately **4%** of newborns. Many babies with this condition can breastfeed without difficulty, but in some cases, a tight frenulum makes latching on difficult. In those cases, **frenotomy** may be indicated.

Ankyloglossia



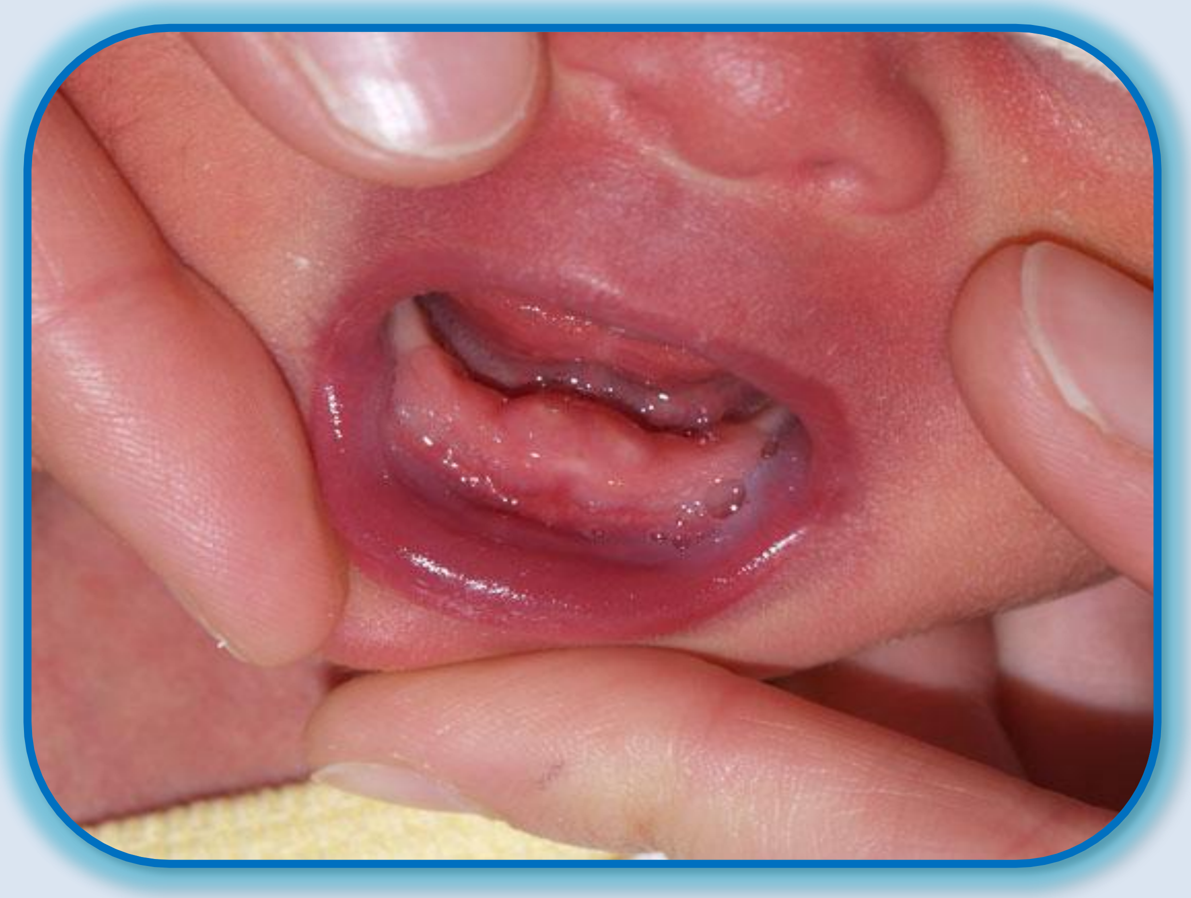
This is the same infant as in the previous photo, immediately after frenotomy. There is no bleeding, and the tongue is more mobile. Latching was significantly improved.

Normal Tongue



In contrast, this baby has no appreciable lingual frenulum, and has good mobility of the tongue with crying.

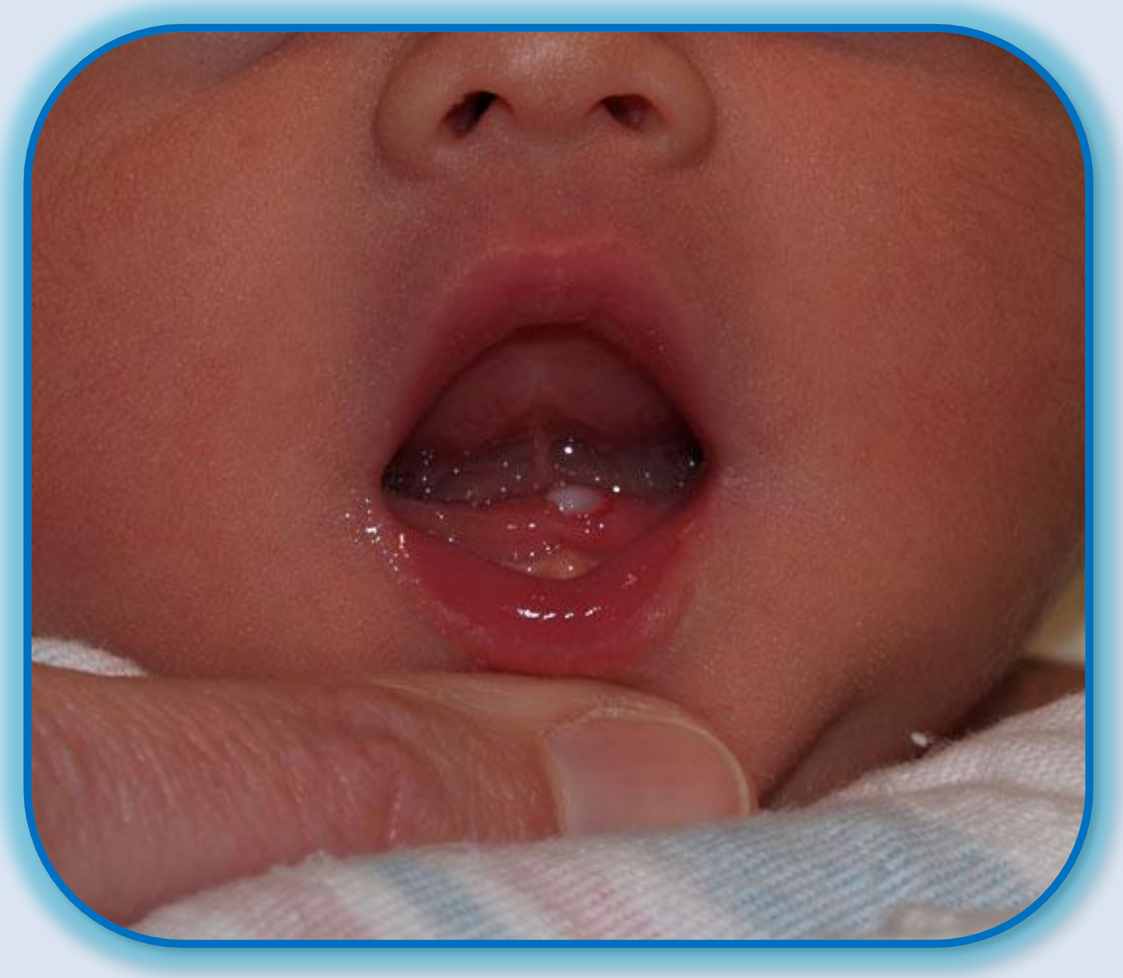
Natal Teeth



Natal teeth usually occur in this location in the **mandibular gum**. In this case, **eruption cysts** are still completely covering the teeth, but with **palpation**, 2 firm teeth can be appreciated.

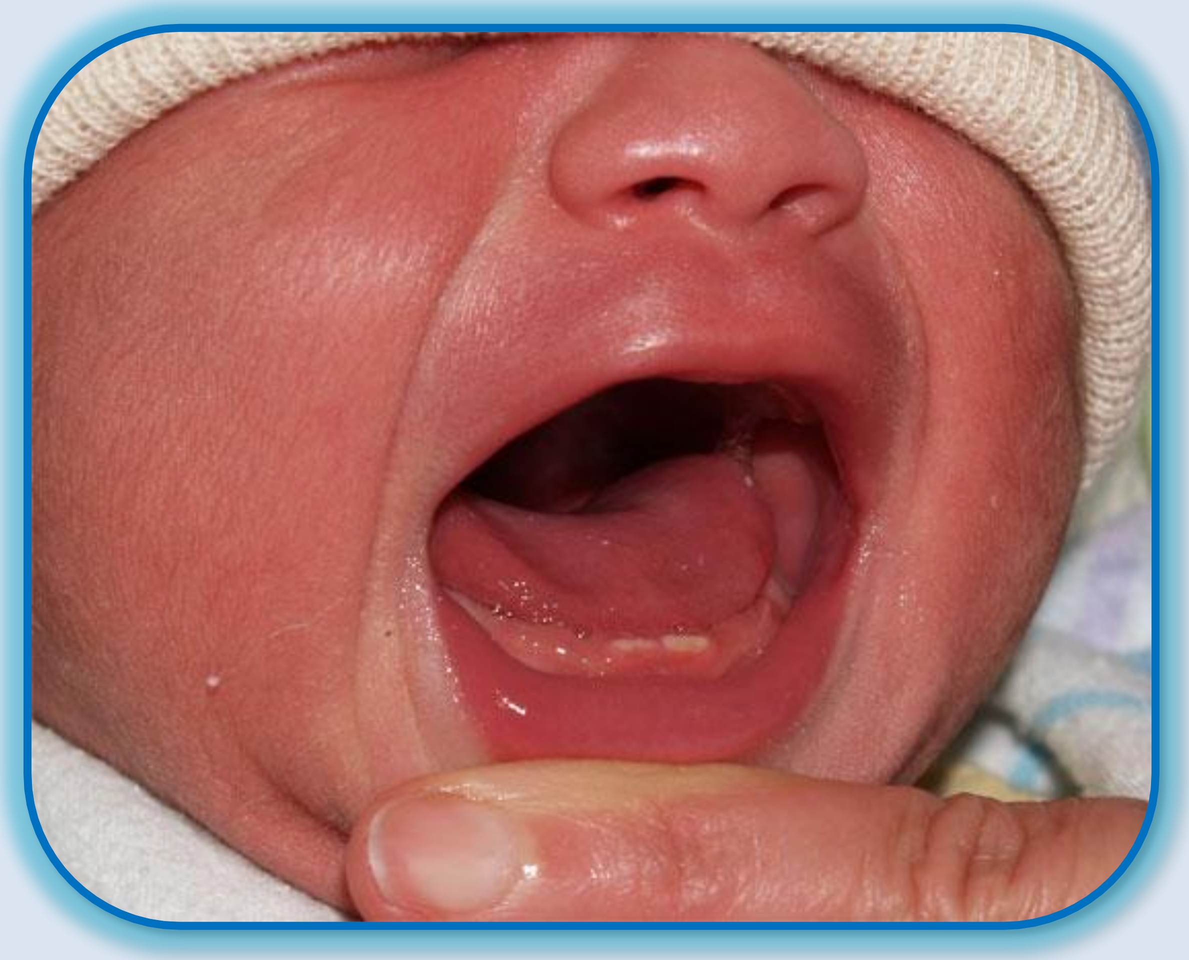
Natal teeth occur in **1:2000 - 1:3500** newborns. They are usually part of the primary dentition of the child, so they **should not be removed unless they are loose**, presenting an aspiration risk, or causing secondary tongue ulceration as in Riga-Fede disease.

Natal Tooth



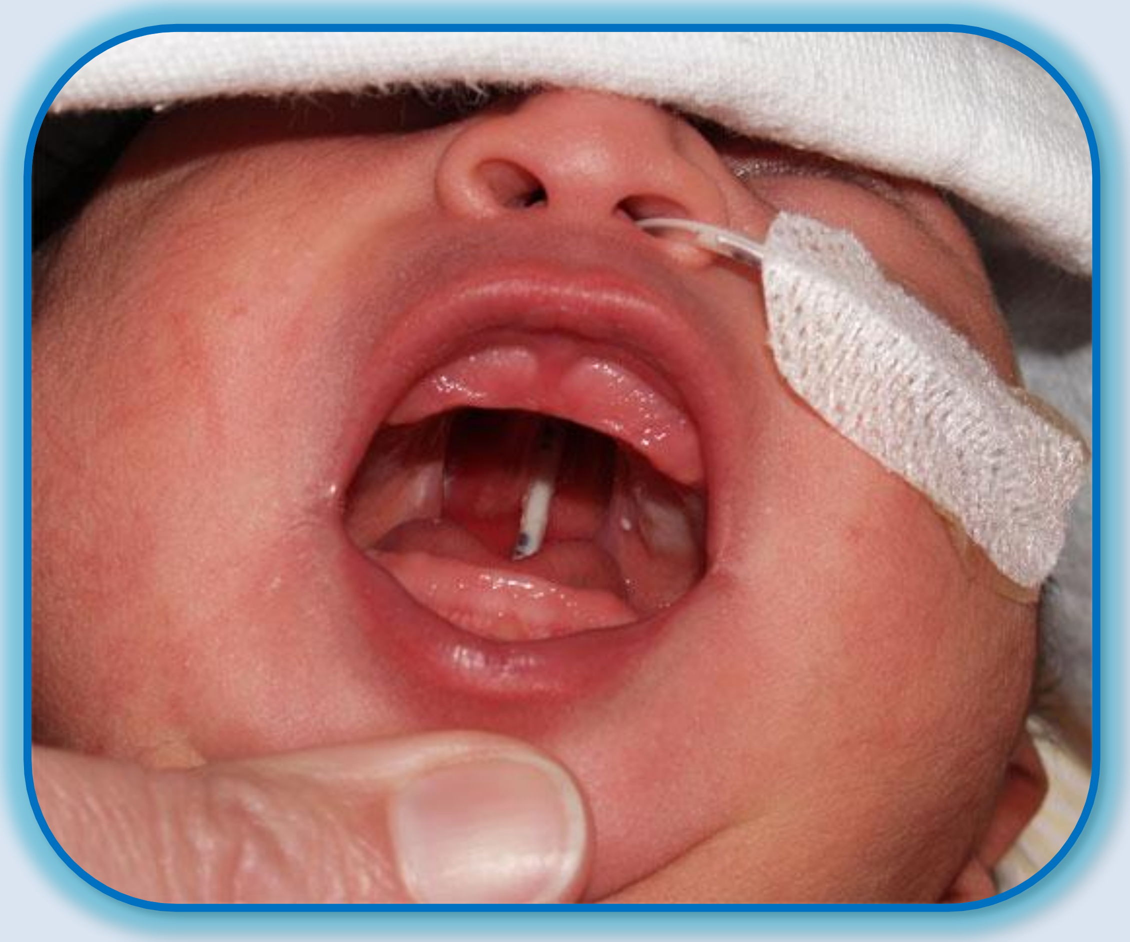
This infant's tooth is erupted and is clearly visible. When the tooth is mobile, it can easily be removed.

Natal Teeth



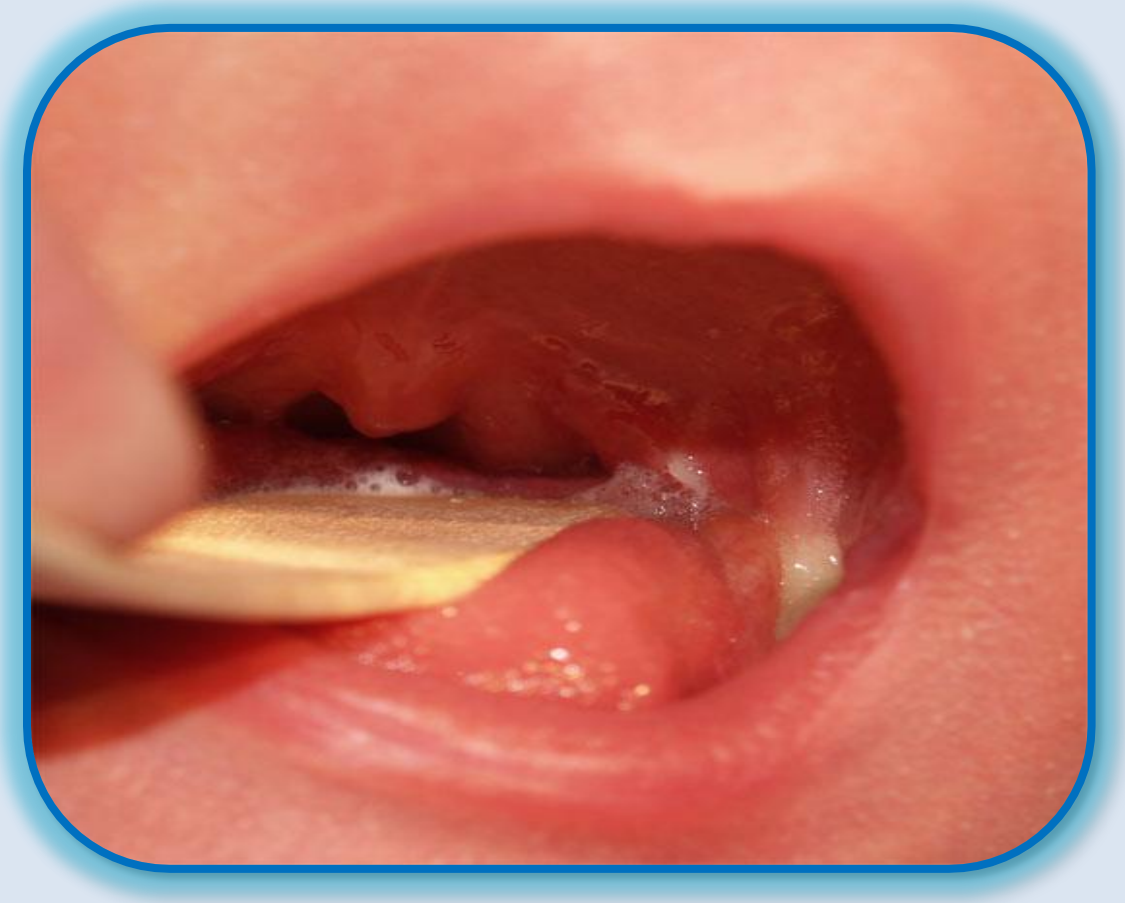
Here is a third example of natal teeth. When palpated, these teeth could be moved slightly, but they were placed low enough in the gum that they do not currently present an aspiration risk. They were not removed.

Cleft Palate



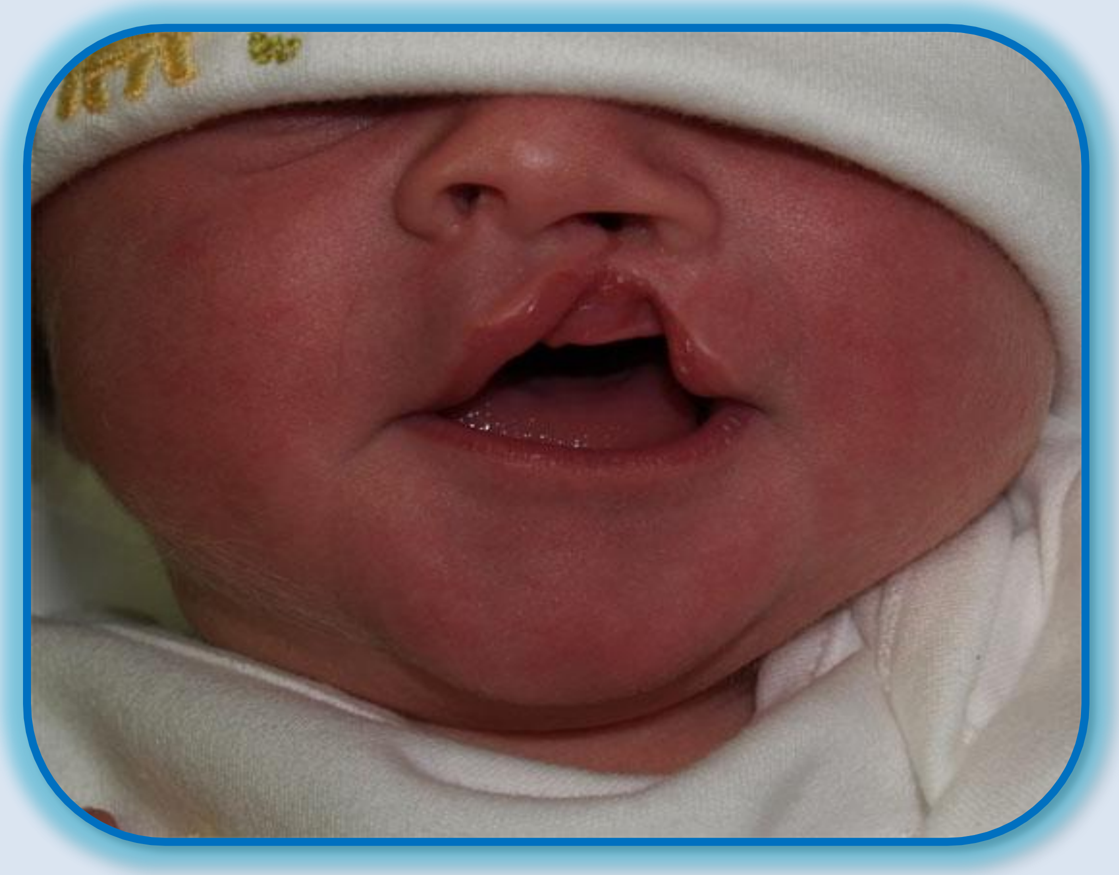
Here, only the lateral margins of the palate are visible. Because the mouth is wide open to the nasal cavity, the NG tube can be seen passing through the nasopharynx as well as the mouth. Cleft palate is not always this obvious. **When examining the palate, the examiner should palpate both the hard and soft palate to check for submucosal and partial clefts**, which are more easily missed.

Bifid Uvula



The uvula is almost twice the normal width, and although it is not clearly bifid, there is a suggestion of two halves. **This finding is known to be associated with submucous cleft** (although clefts can occur with a normal uvula, and bifid uvula may be an isolated finding).

Cleft Lip



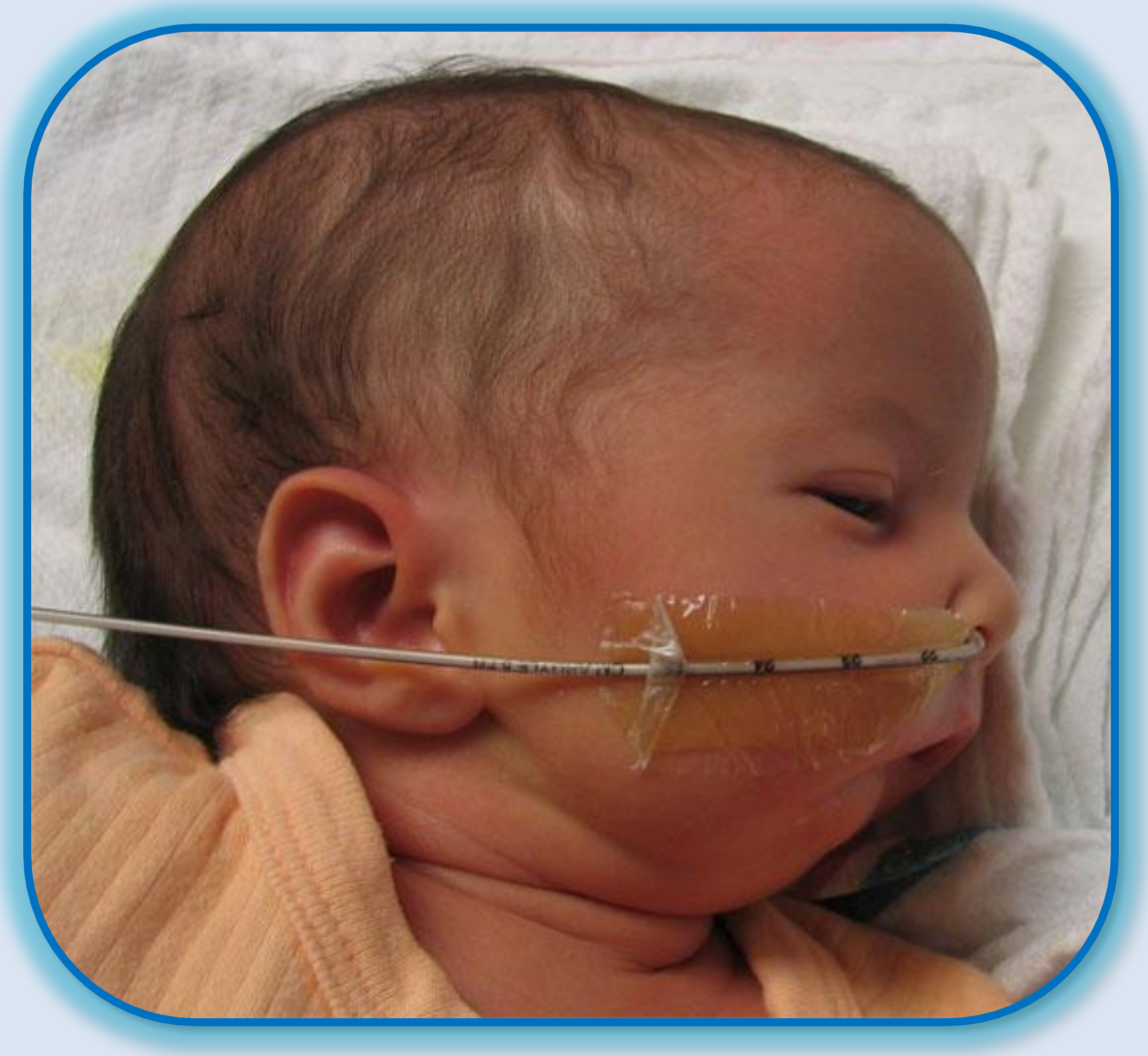
This infant has a normally formed, intact palate, but has a unilateral cleft on the left side.

It is **important** to distinguish unilateral (or bilateral) cleft lip from the more unusual and concerning midline clefts that can occur.

Midline clefts are often associated with underlying **midline defects** in the brain or other structures, whereas the type of cleft pictured above is more likely an isolated finding.

Feeding can be impaired in infants with cleft lip. If needed, a **Haberman bottle feeder** may be helpful.

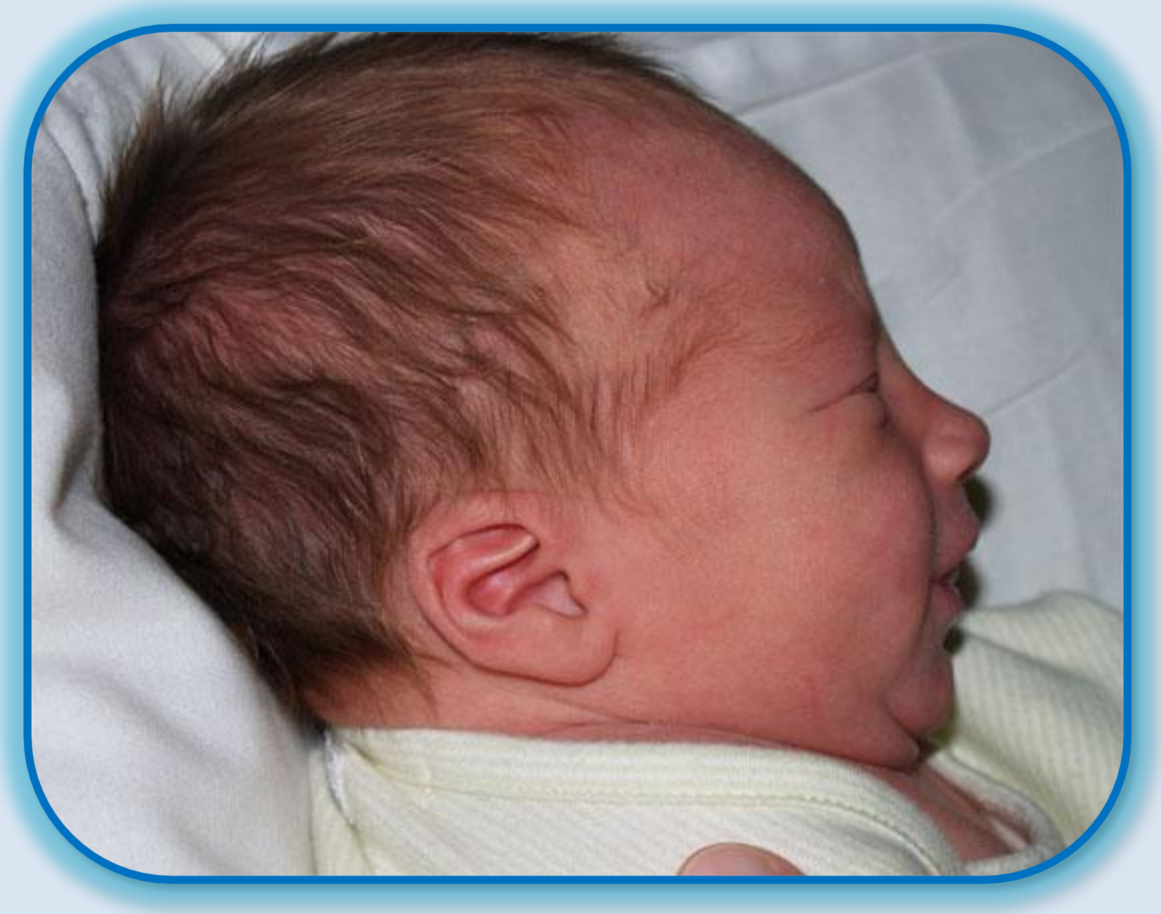
Micrognathia



Micrognathia, or **"small jaw"**, can often be best appreciated when looking at the **profile** of the infant. While many infants may appear to have a slightly **recessed chin**, the appearance above is clearly abnormal.

Underlying genetic conditions should be considered in cases such as this.

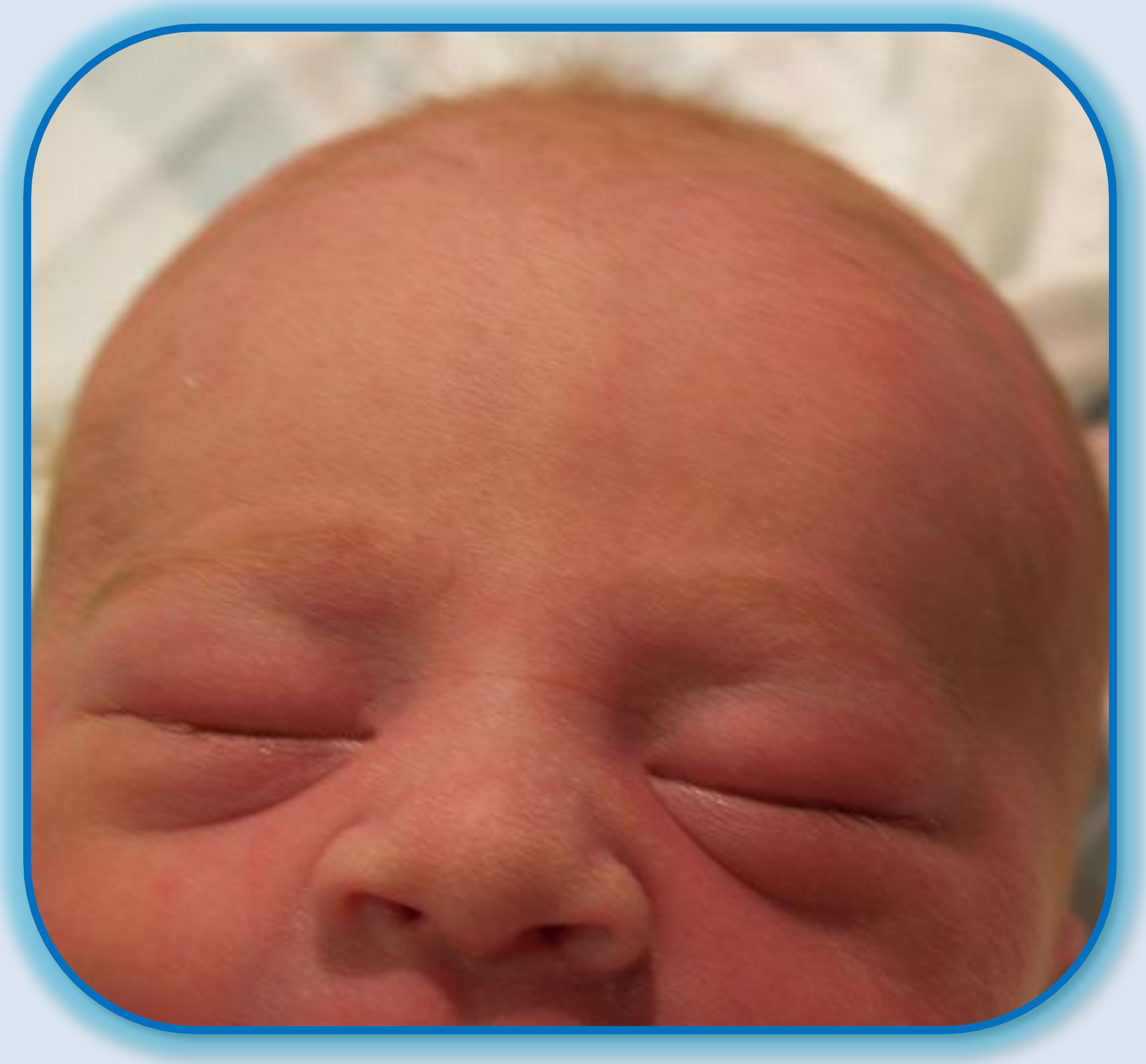
Normal Chin



For comparison, this is a normal newborn. Although the chin is less prominent than the upper lip, this is a normal profile for an infant.

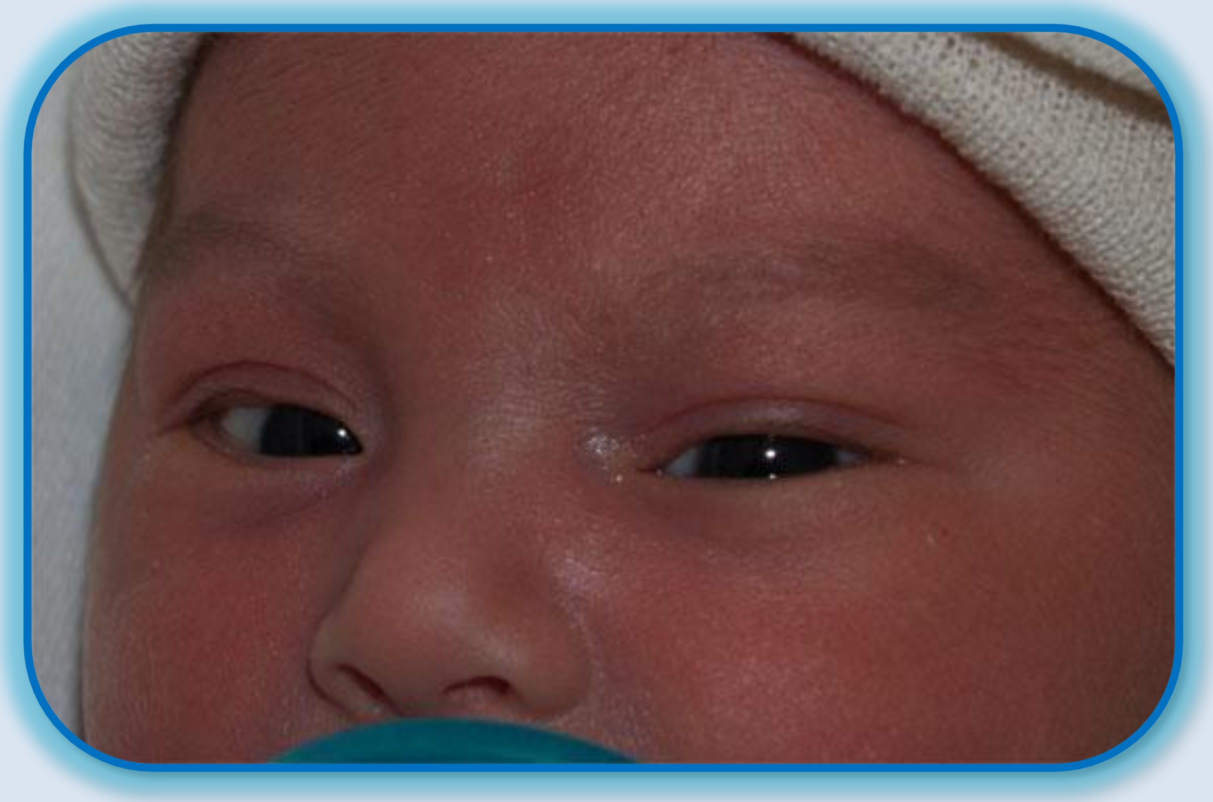
Eyes

Eyelid Edema



Most infants exhibit some degree of eyelid edema after birth. The **puffiness** may make it seem that the infant has difficulty opening one or both eyes, but with a gentle examination, the eye can be easily evaluated. Edema **resolves over the first few days**.

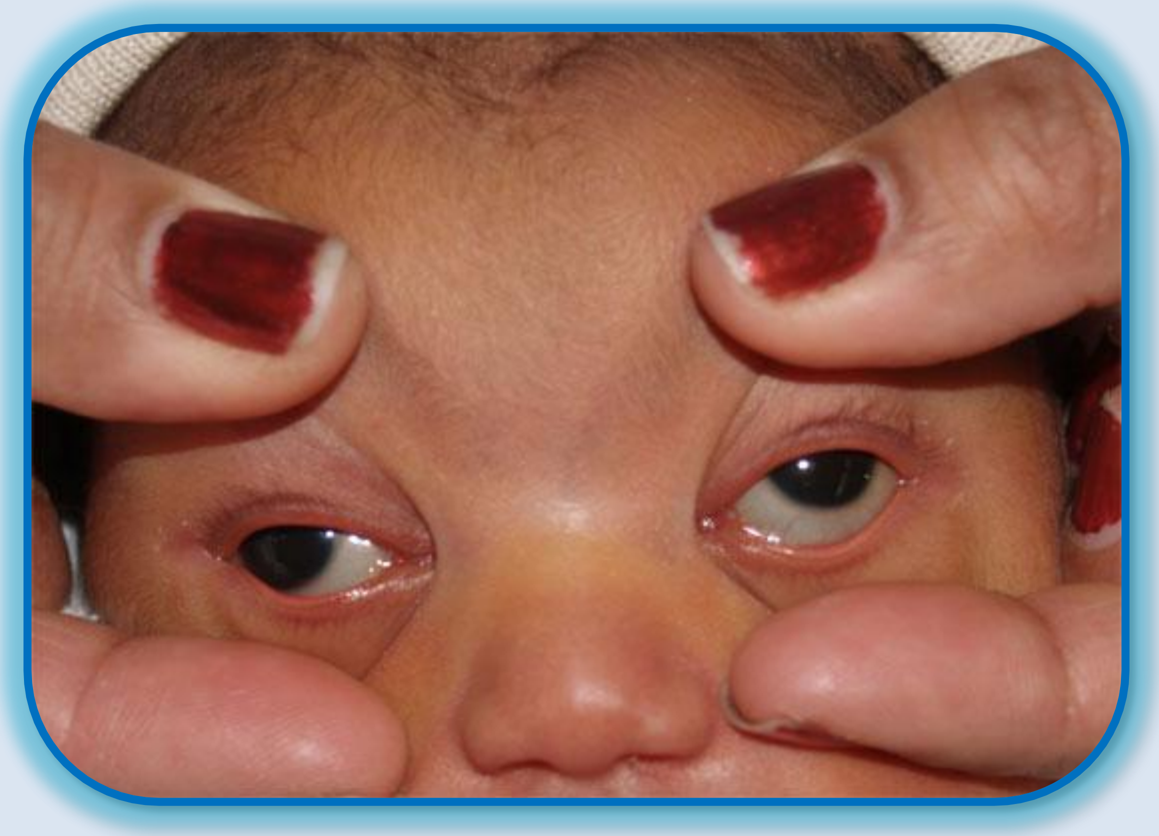
Dysconjugate Eye Movements



During the first few months of life, newborns will frequently have dysconjugate eye movements, where the eyes appear to move independently. Eyes may transiently appear crossed or divergent. This phenomena is particularly noticeable when the infant is falling asleep or being woken from sleep.

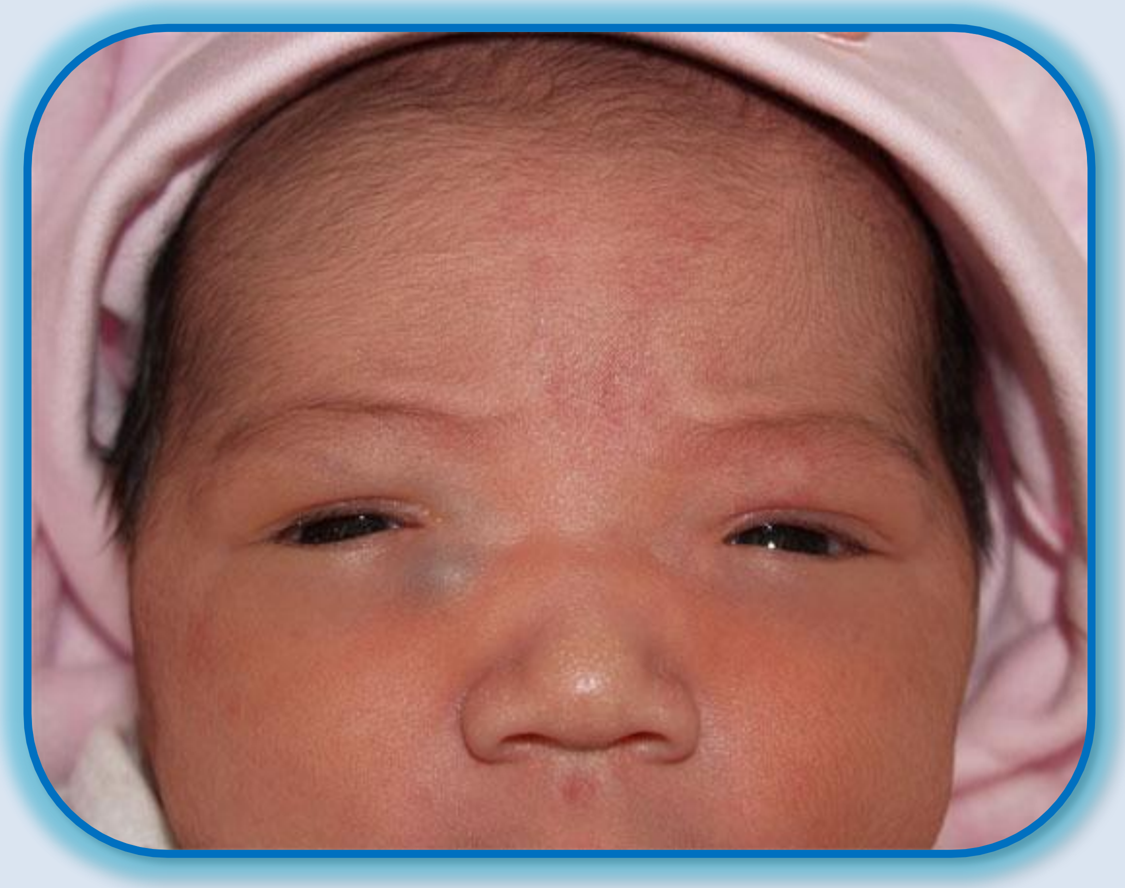
If the dysconjugate movement is **fixed** (one eye is always out, or always in, relative to the other), a pediatric **ophthalmologist** should be consulted. **But if the movements are transient, it is a normal finding and will spontaneously resolve**.

Dysconjugate Eye Movements



Here is another example of dysconjugate eye movements. This infant was sound asleep when the lids were gently opened for the photo. When awake, the infant could easily fix and focus on the mother's face.

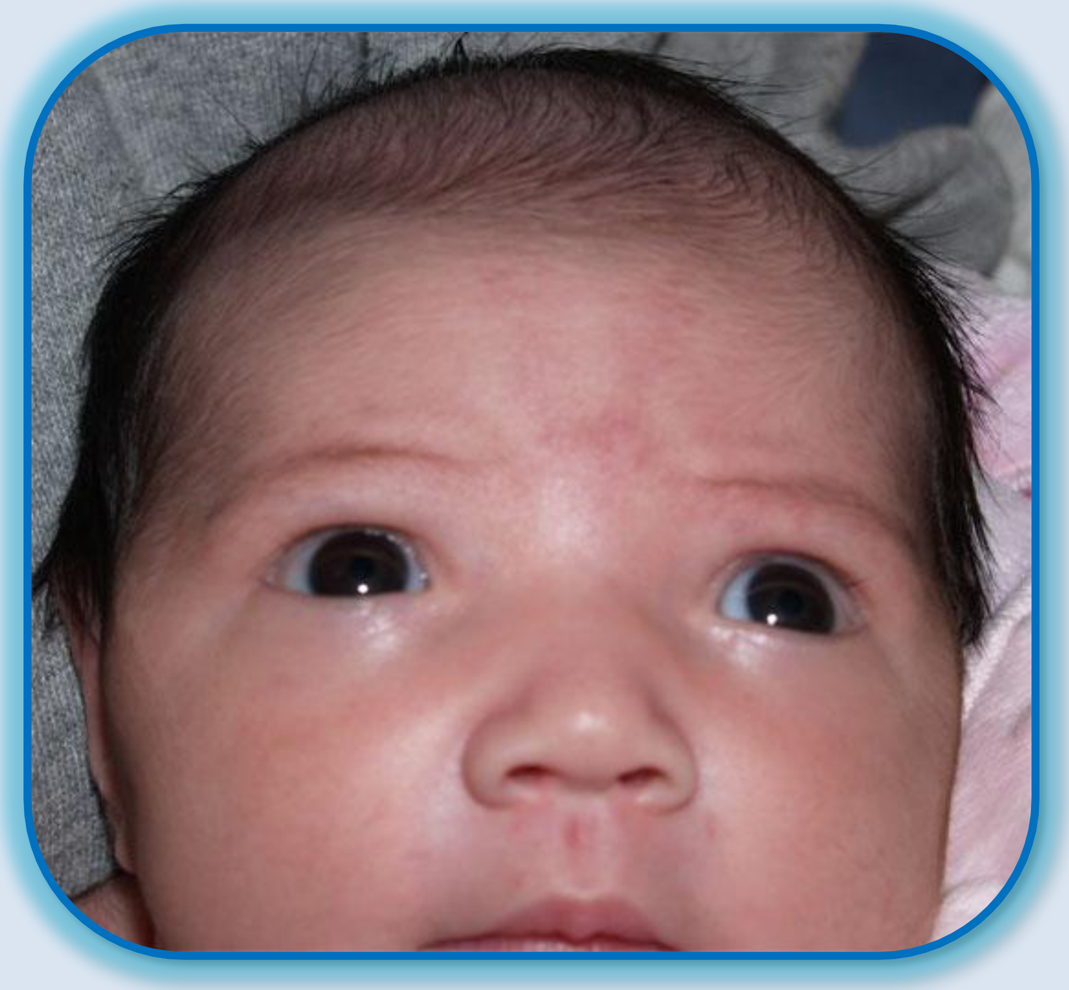
Dacrocystoceles



This infant was noted at birth to have some **bluish nodules** inferior to the medial canthi of both eyes, widely spaced eyes (hypertelorism), and a flat nasal bridge. The nodules are dacrocystoceles. They are caused by obstructions at both superior and inferior ends of the nasolacrimal duct.

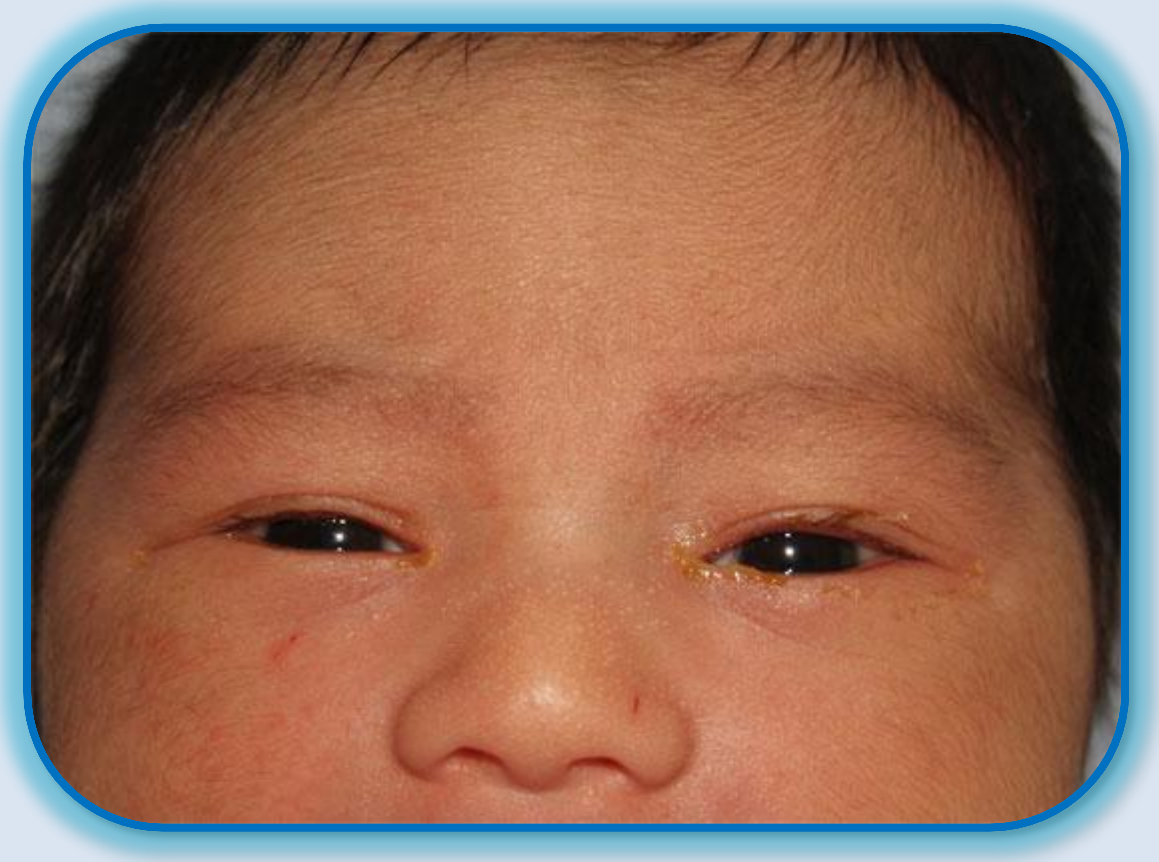
Though relatively small externally, these lesions almost completely obstructed the nasal passages. For this reason, internal nasal evaluation is recommended when the dacrocystoceles are bilateral, even when the patient is otherwise asymptomatic.

Dacrocystoceles



Approximately 4 days **after surgery**, the bluish discoloration and the lumps medial to the eyes are gone. There is also a diminished appearance of hypertelorism (which is exaggerated in patients with bilateral dacrocystoceles).

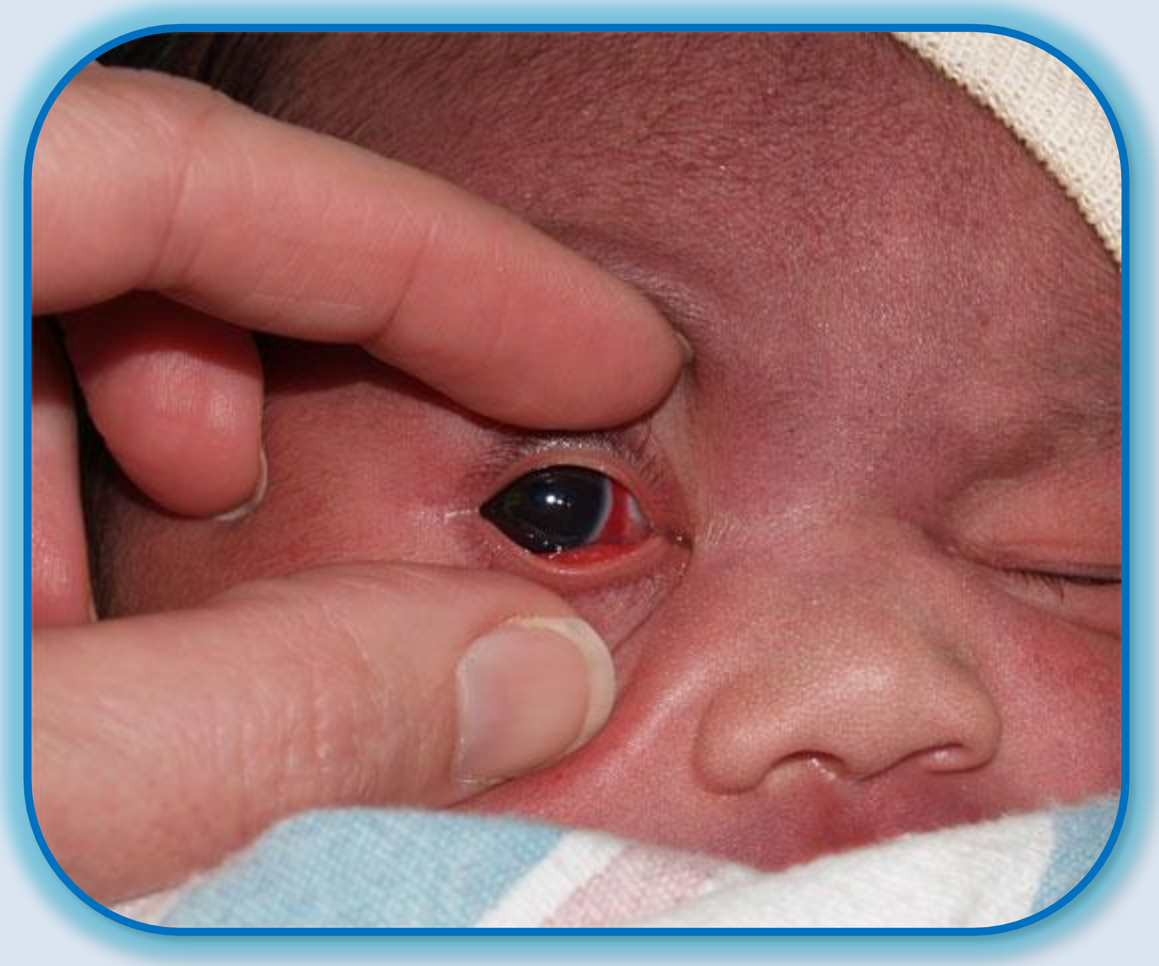
Dacrostenosis



In this baby, both eyes are affected, although there is slightly more **discharge** around the left eye than the right. The **sclera** of both eyes are **clear**, and there are no other signs of infection.

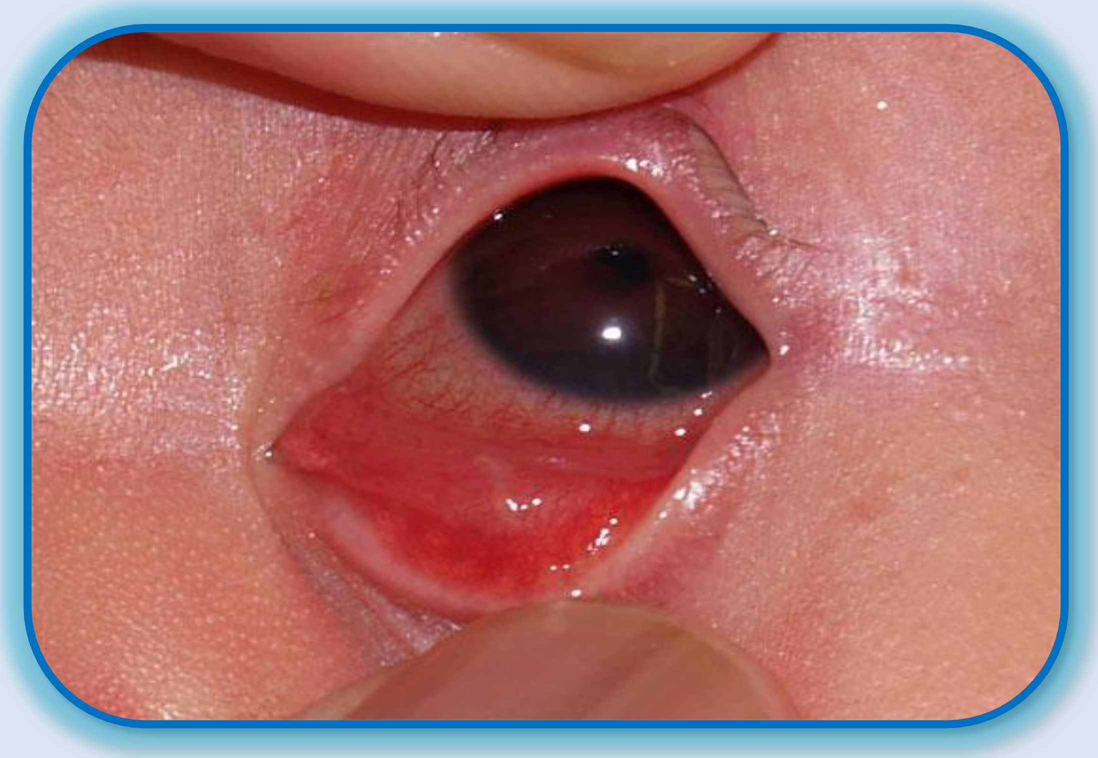
For about **half** of affected patients, this **will resolve within the first week of life**. For the **other half**, spontaneous resolution is expected in **several weeks to a few months**.

Subconjunctival Hemorrhage



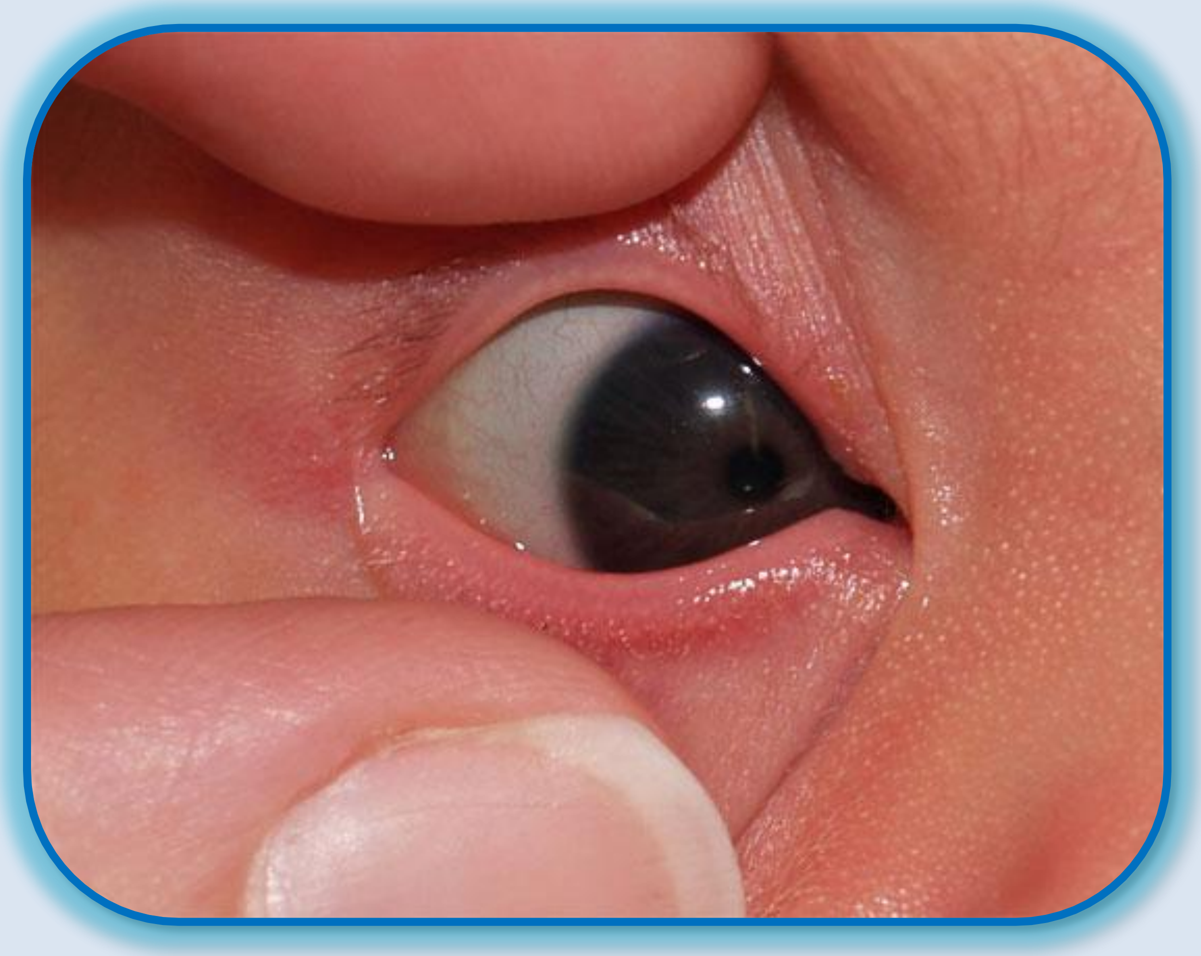
Subconjunctival hemorrhage is a **frequent** finding in normal newborns. It results from the breakage of small vessels during the pressure of delivery. The red area may be large or small but is always confined to the limits of the sclera. It is **asymptomatic**, does not affect vision, and **spontaneously resolves** in several days. Note also the numerous **petechiae** on the forehead. This infant had significant facial bruising as well as the eye finding.

Iris Cyst



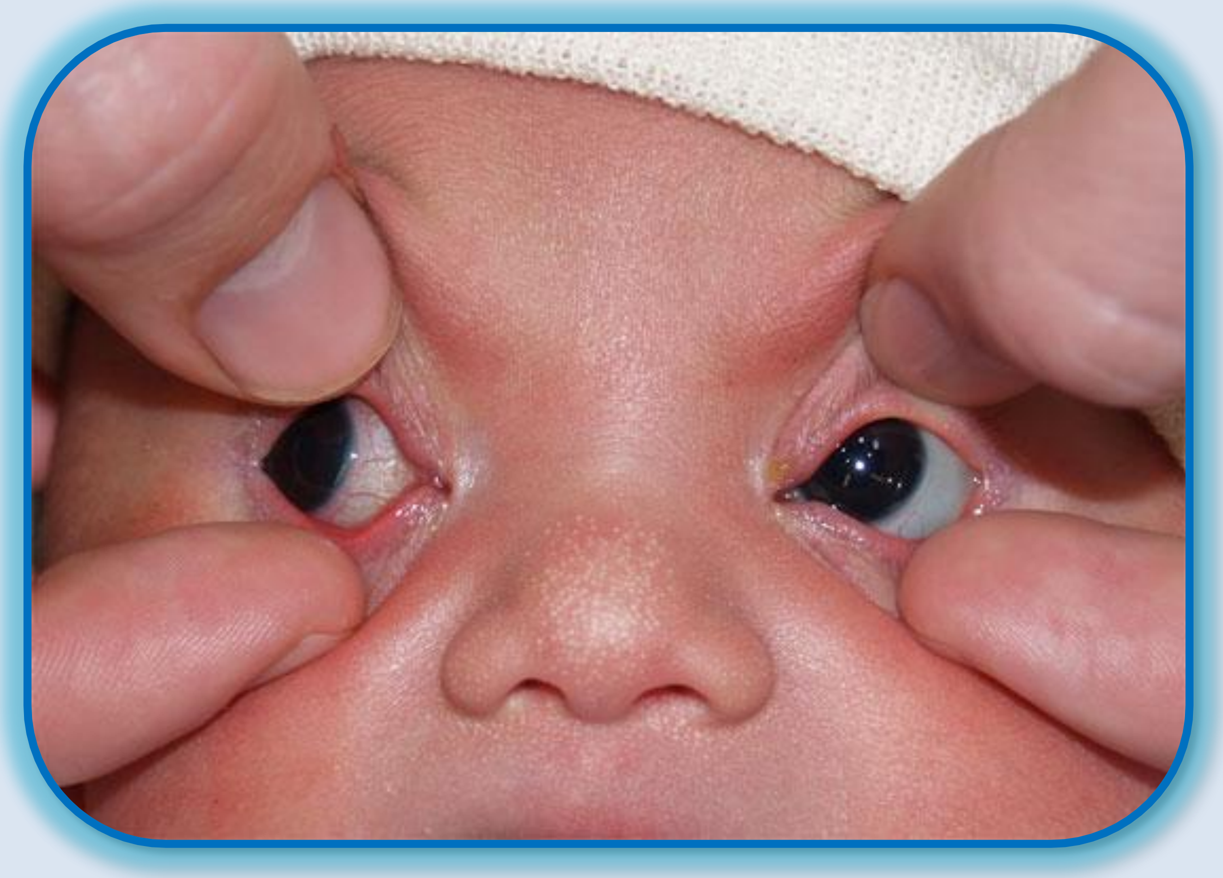
On examination of this infant, he was found to have markedly injected sclera and absent red light reflex. With careful inspection, a reddish discoloration over the iris, and opacity within the pupil can be seen. This is presumed to be an iris cyst, an extremely **rare** finding. Interestingly, this cyst **spontaneously resolved** over the next few months.

Normal Eye



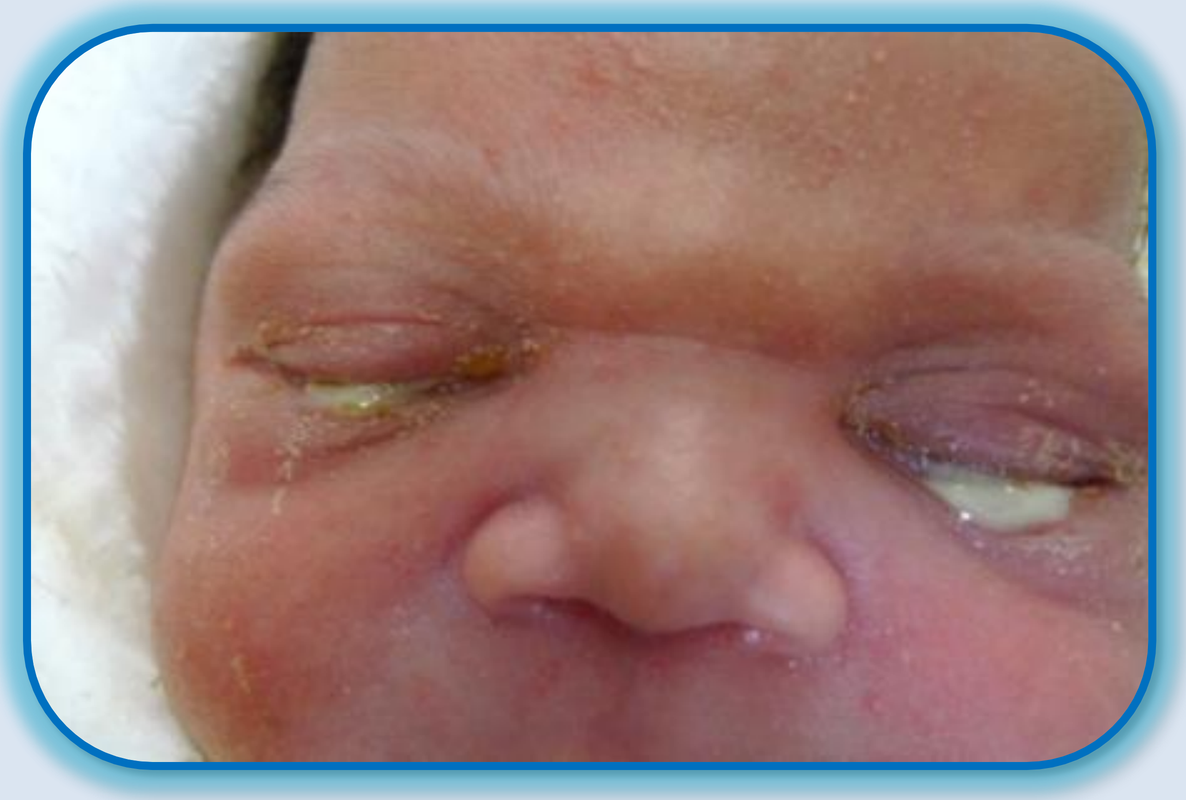
For comparison, this is the completely normal right eye of the same infant. Note the lack of injection in the sclera, the normal grayish blue iris and the clear pupil. A red reflex was easily obtained in this eye. Although gonococcal conjunctivitis was initially in the differential diagnosis, the lack of significant discharge and the unilateral nature made bacterial conjunctivitis unlikely.

Injected Eye



A newborn with unilateral conjunctival injection. On initial examination, the right pupil was about 2mm in diameter and the normal left pupil was 5-6mm. Absent red reflex on the right side and the retina could not be well seen. The differential diagnosis includes tumor and vascular abnormalities. An ultrasound of the eye was done to evaluate this finding further.

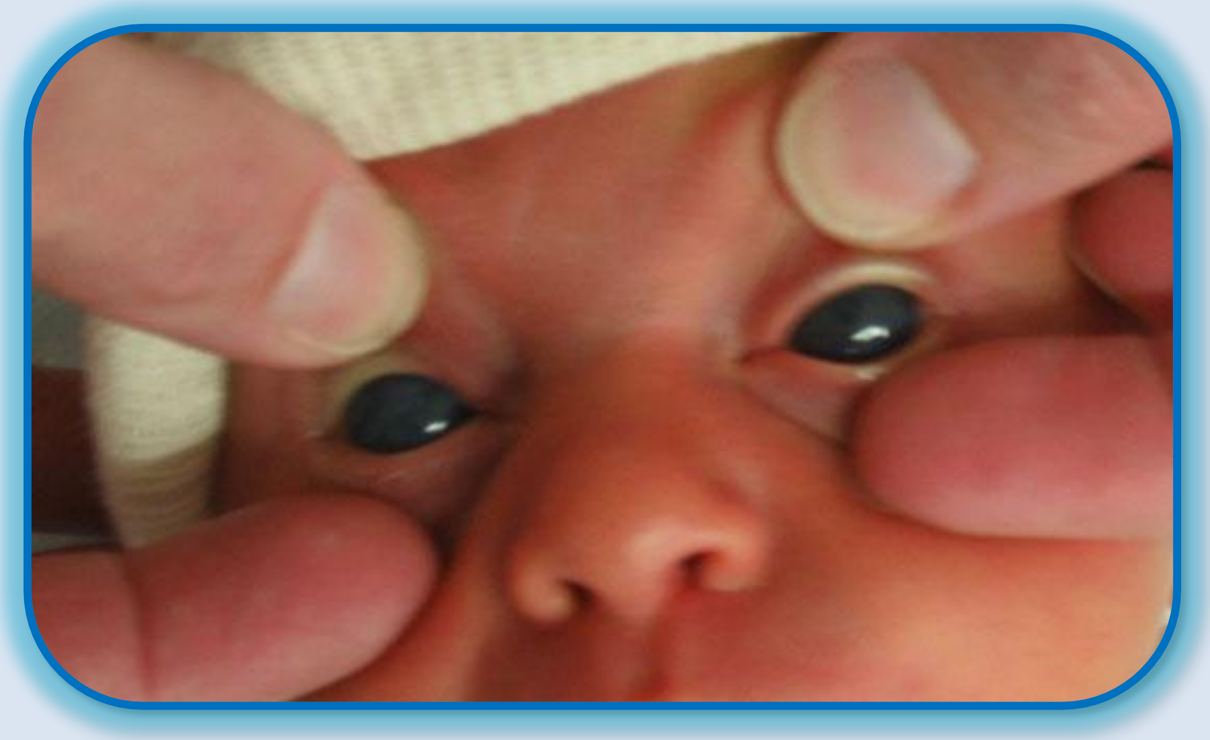
Gonococcal Conjunctivitis



When gonococcal conjunctivitis occurs, it typically presents in the **first few days** of life with copious, **purulent discharge** in the eyes. In this infant, the marked **edema** of the eyelids was the first symptom noted, but with just slight pressure on the lids, purulent material oozed out.

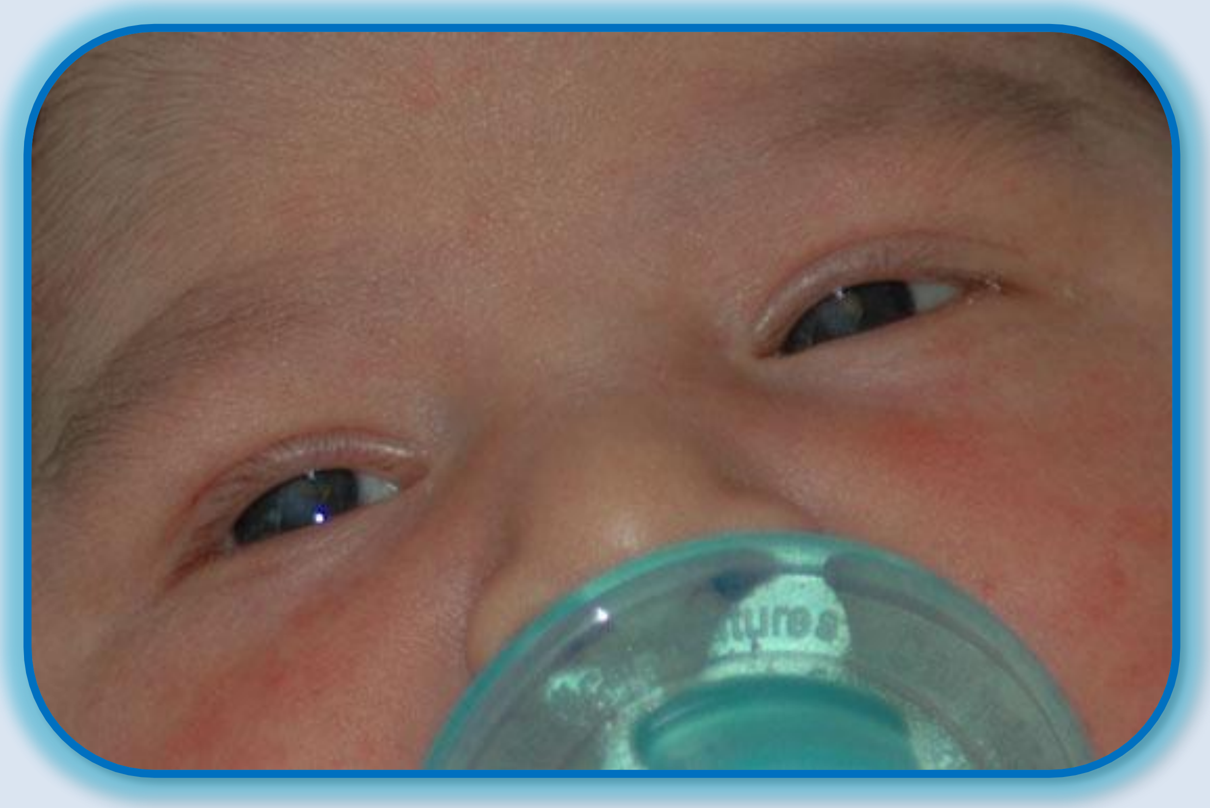
Unlike the typical "pink eye" conjunctivitis that occurs in older children, gonococcal conjunctivitis is an ophthalmologic **emergency**. Because the bacteria can **erode** through an intact cornea, **treatment is very aggressive** and includes systemic intravenous antibiotics, frequent eye washes, and monitoring in a neonatal intensive care unit. Fortunately, this diagnosis is very uncommon in places where **prophylactic antibiotic eye ointment is used at birth**.

Congenital Glaucoma



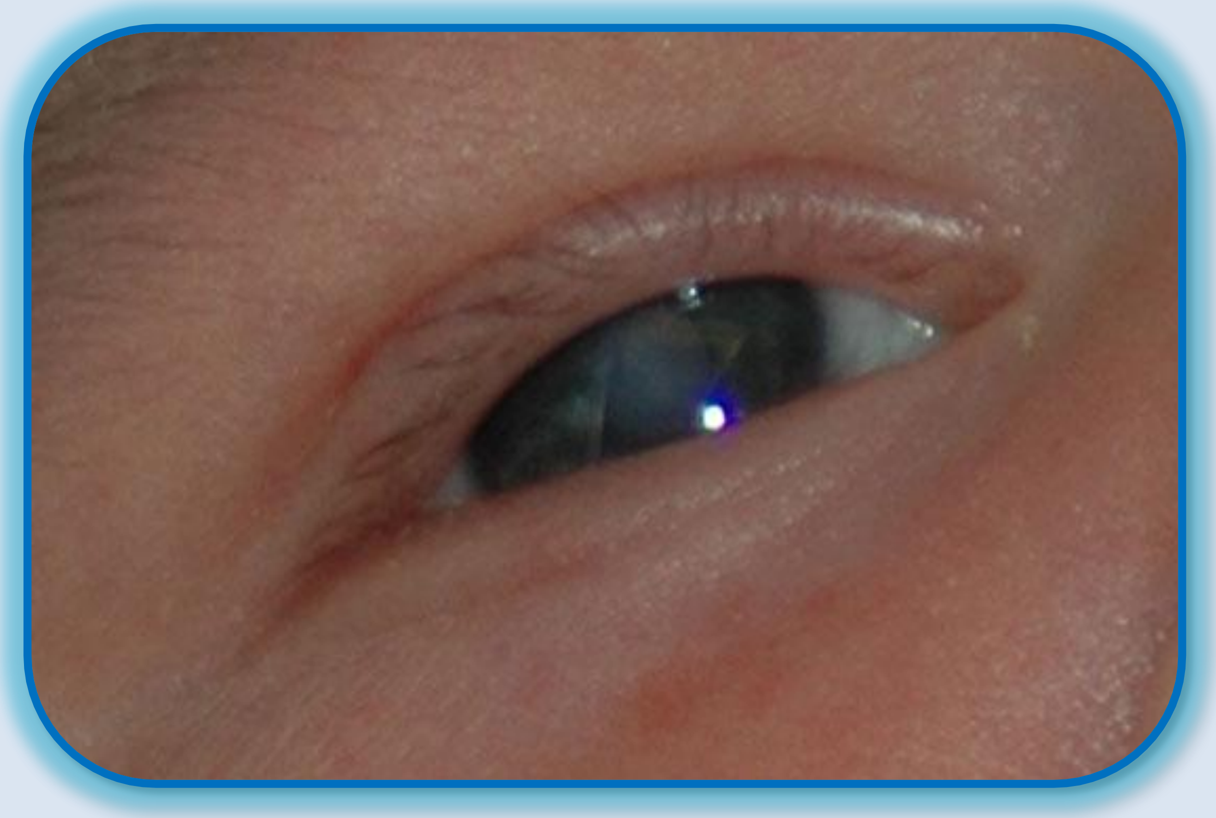
This infant presented with **hazy bilateral corneal opacities** on the initial newborn exam. The diagnosis was relatively easy as there was a strong family history of congenital glaucoma.

Peter's Anomaly



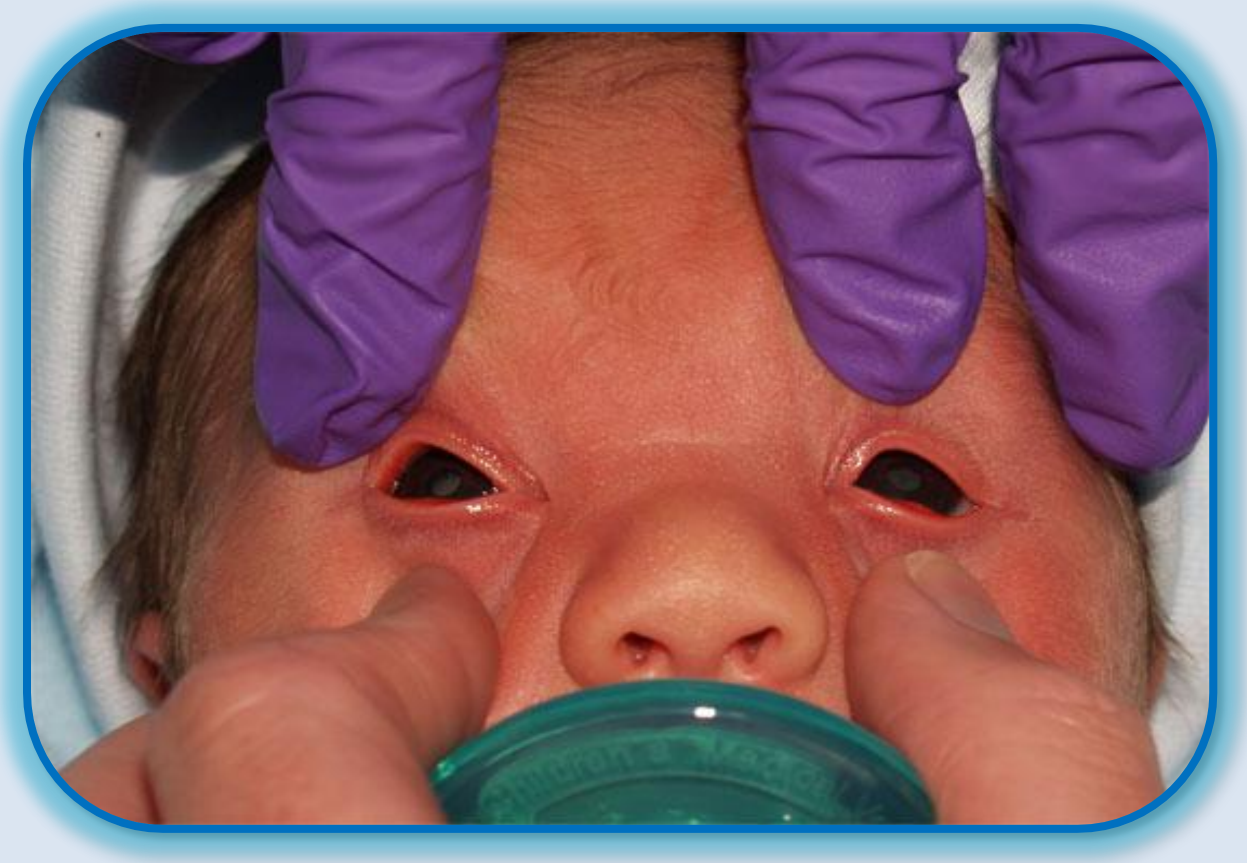
This infant is has **bilateral haziness of the central corneas** visible without special equipment. On evaluation with an ophthalmoscope, **red reflexes could not be seen** in either eye due to these opacities.

Peter's Anomaly



The same infant as the previous photo. Although the opacity is central and could be mistaken for opacity of the lens, a view from a more oblique angle shows the **cloudiness extends over parts of the iris** as well.

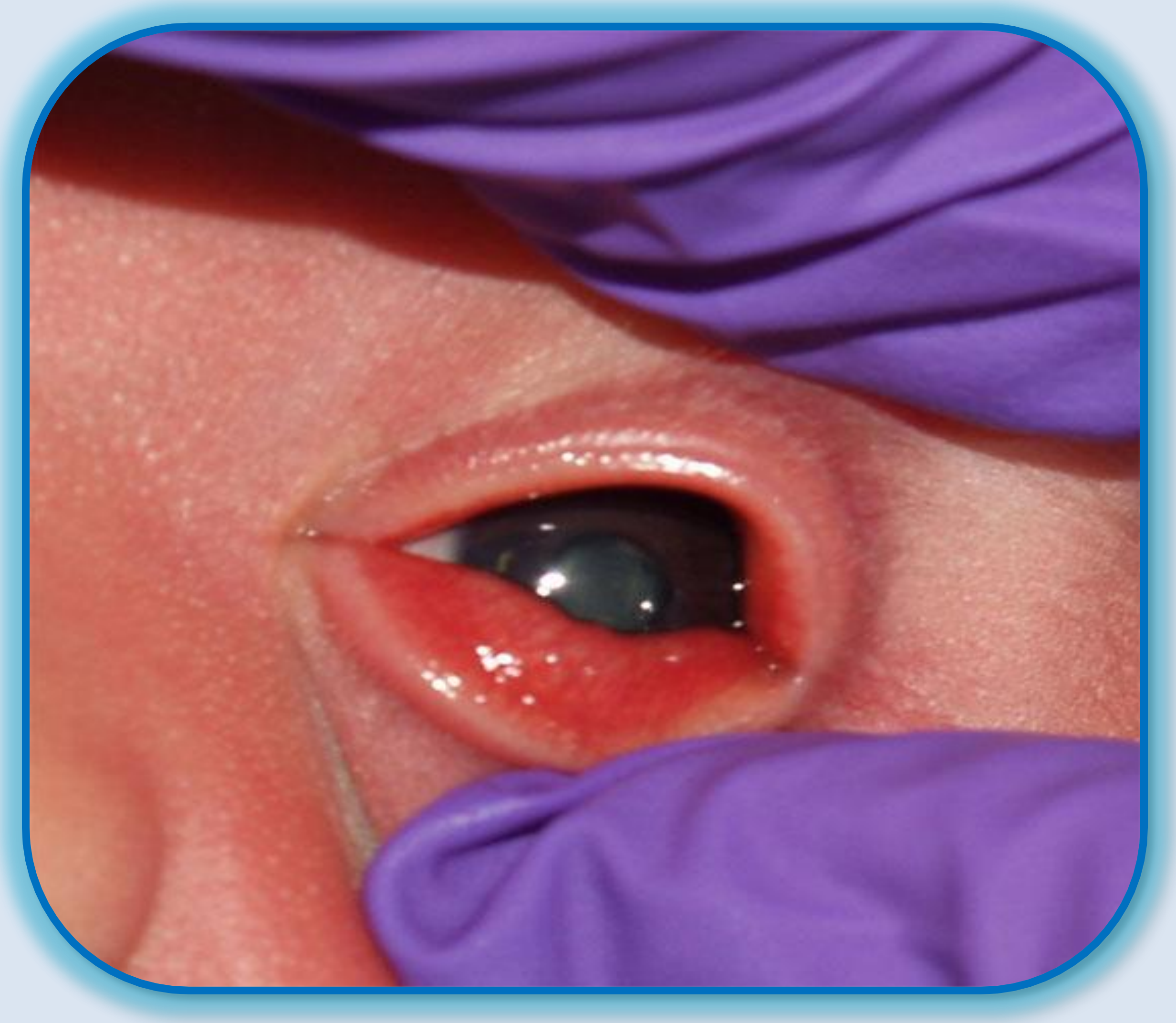
Congenital Cataracts



In contrast to the previous photos, the **opacities** here occur **behind the pupil**, as the pupil is easily and clearly seen along its entire circumference. Again, the opacity can be appreciated without any special equipment. **Red light reflexes could not be obtained** from either eye.

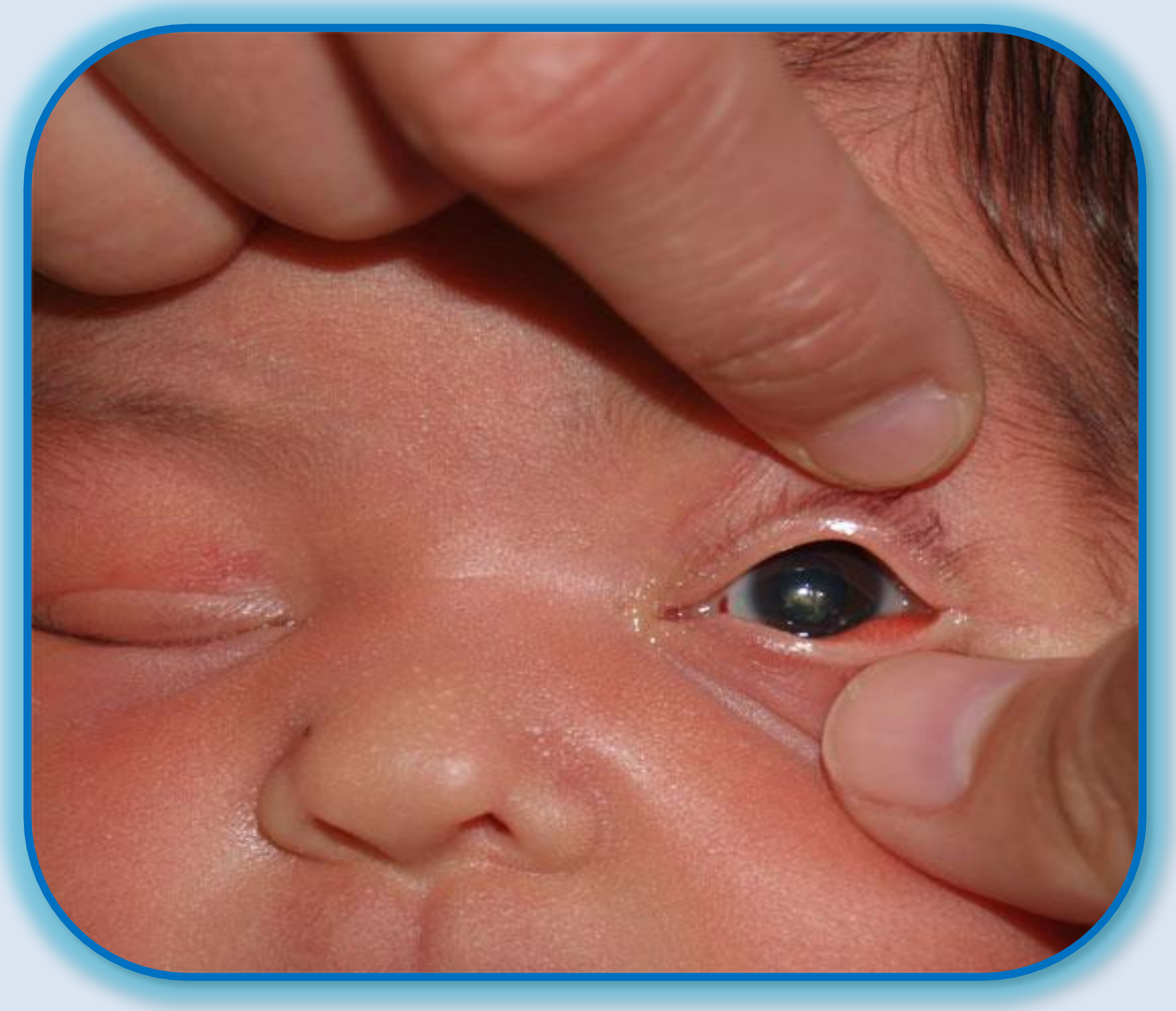
This finding needs **workup** to identify the underlying etiology, as a long list of metabolic, infectious, and genetic disorders are associated with cataracts. This infant was otherwise well and had a positive family history of congenital cataracts, so **autosomal dominant inheritance** was suspected.

Congenital Cataract



With a closer view, cloudiness within the pupil is clearly seen. Congenital cataracts **require early intervention** to preserve sight, so **immediate referral** to a pediatric ophthalmologist is indicated. It is important to remember that cataracts that are less dense may not be visibly cloudy, **so** **any time red reflexes cannot be obtained on exam, even if the eye appears grossly normal, referral is required**.

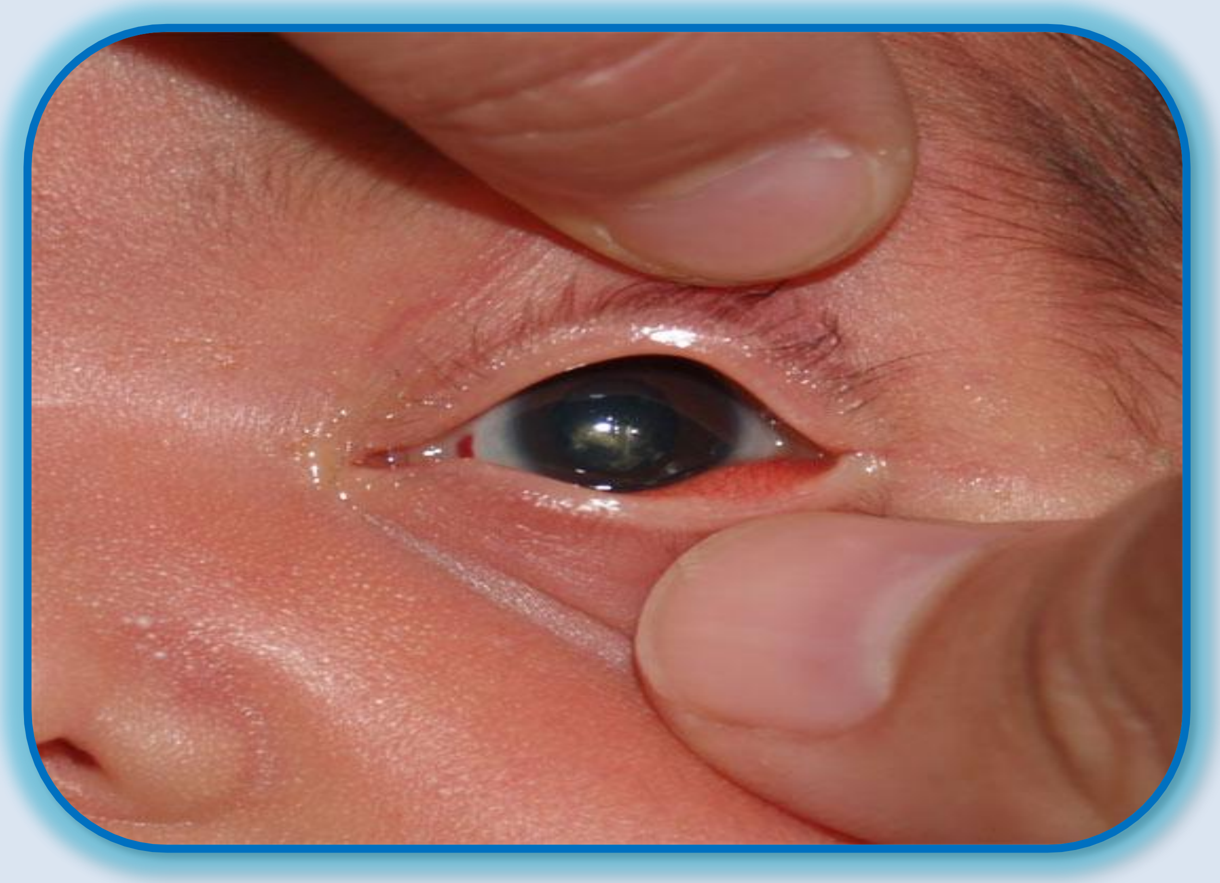
Congenital Cataract



This cataract was less obvious on initial exam. When the pupil was not dilated, only a hint of white was appreciated. The more notable finding was the **lack of a red reflex**.

After dilating drops were placed, the opacity was more visible. Even though this cataract is not as dense as the one in the previous photo, **surgical correction within the first two months of life is still necessary** to preserve sight.

Congenital Cataract

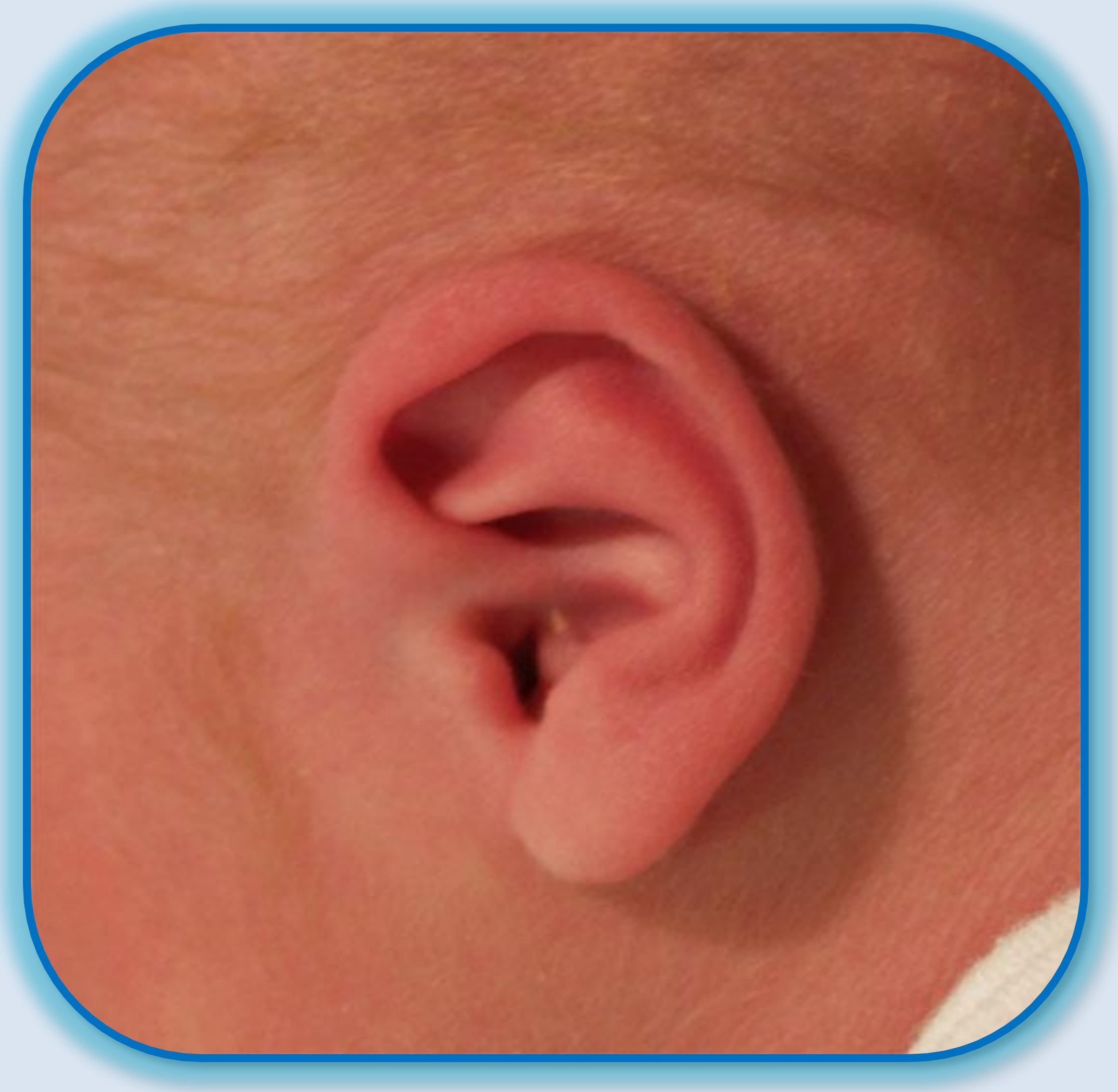


With a closer look, the opacities can be seen as smudges of white in the inferior pupil. This is a **lamellar cataract**. Again, newborns with congenital cataracts **should be evaluated** for underlying metabolic, genetic, or infectious conditions. **Only 20% of patients with cataracts will have an identifiable cause**, but when associated conditions occur, prompt recognition and treatment can prevent further complications.

A subconjunctival hemorrhage is seen (a frequent finding shortly after birth). It is benign and unrelated to the cataract.

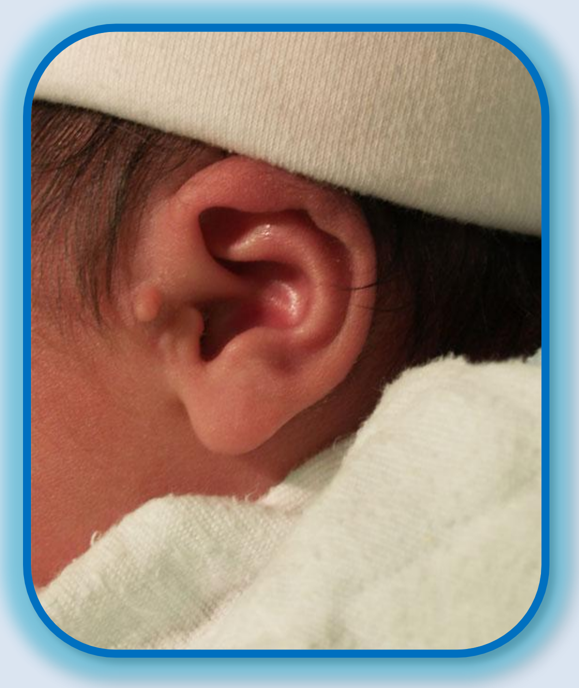
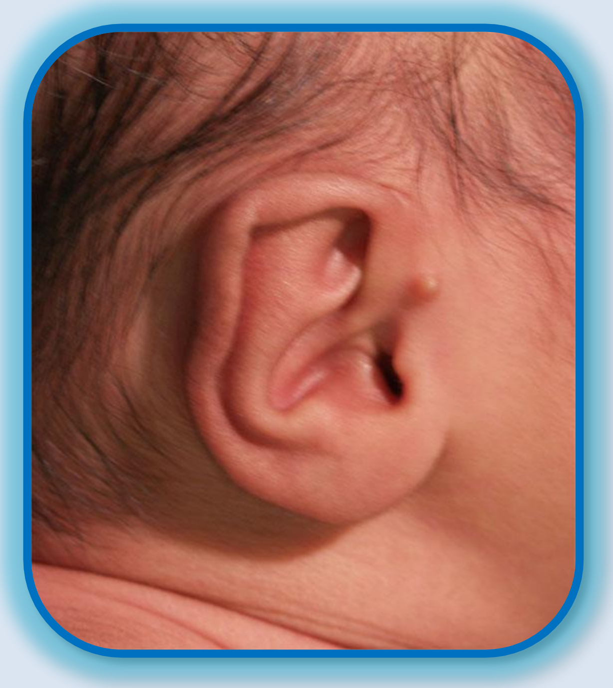
Ears

Normal Ear



Many variations in size and shape exist within the label of "normal ear", but in general, the normal ear is one in which all the structures (helix, antiehelix, tragus, antitragus, scaphoid/triangular fossa, and external auditory canal) are all present and well formed.

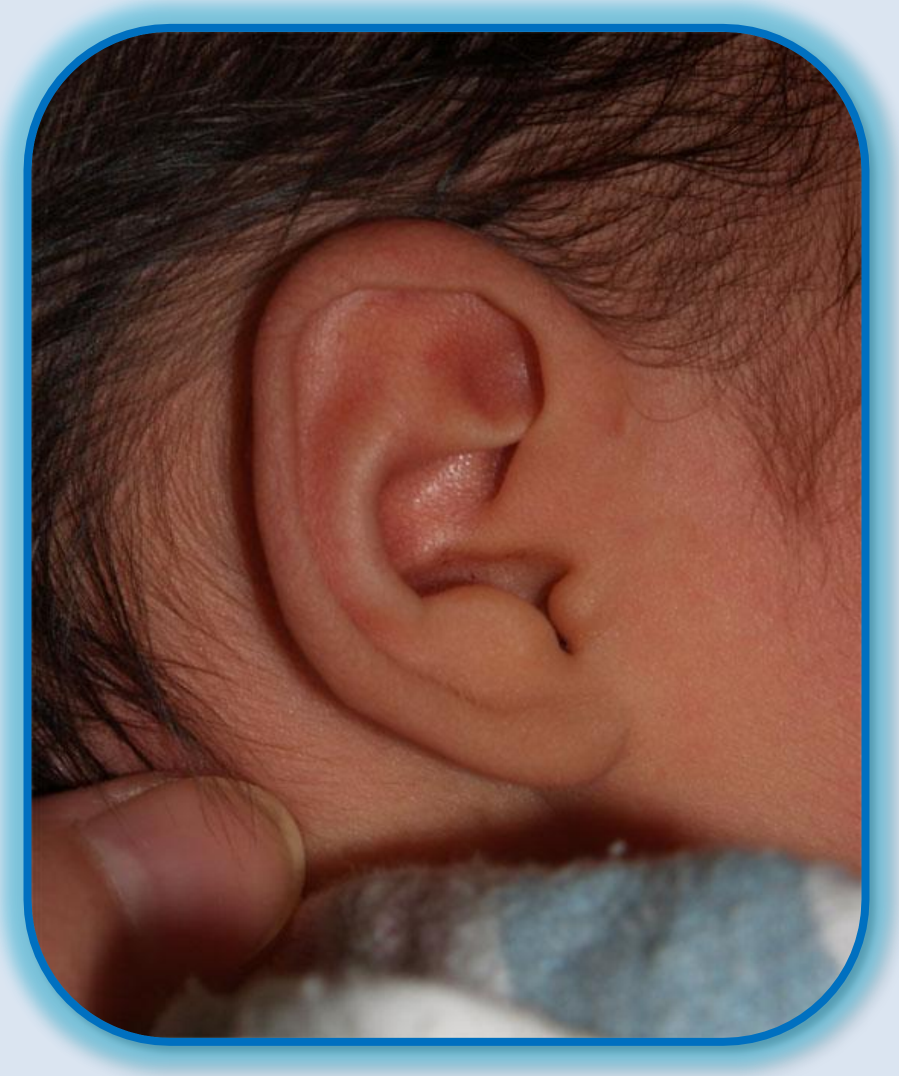
Ear Tag

A single, small ear tag is an **occasional** finding on physical examination.

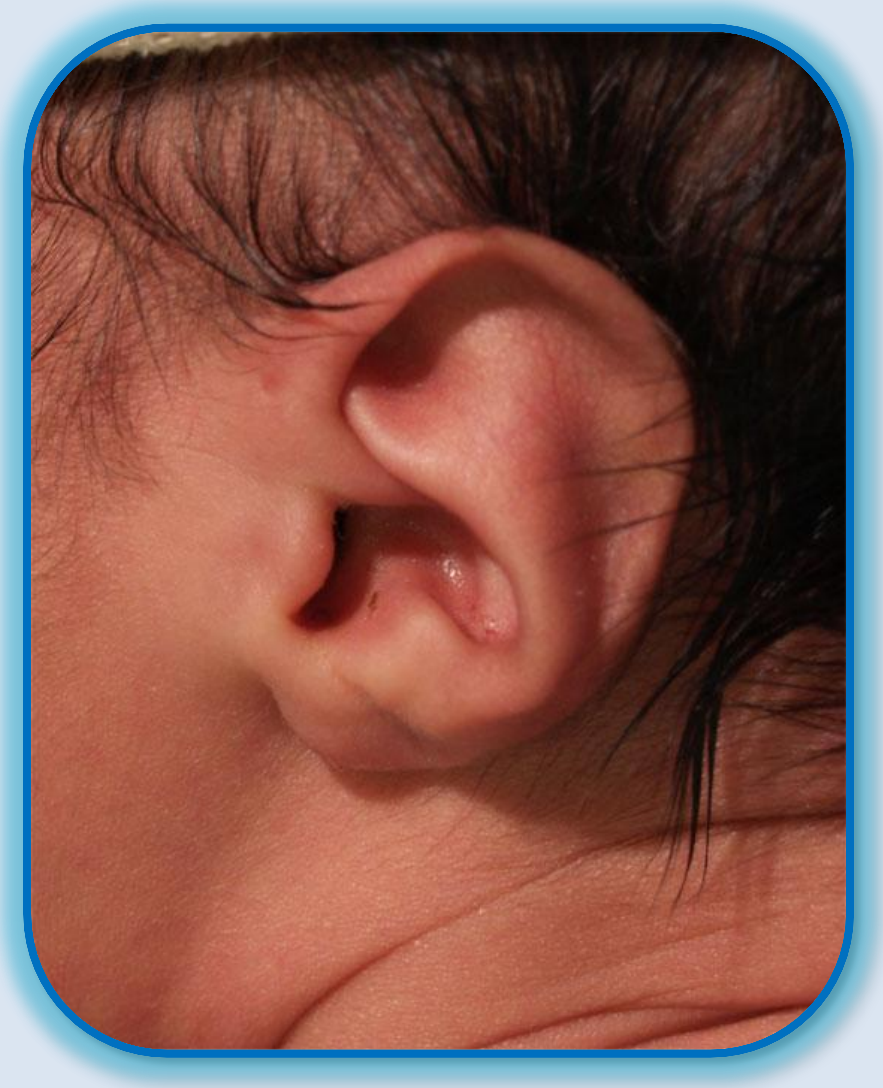
It is **often inherited** as a familial trait.

Ear Pit



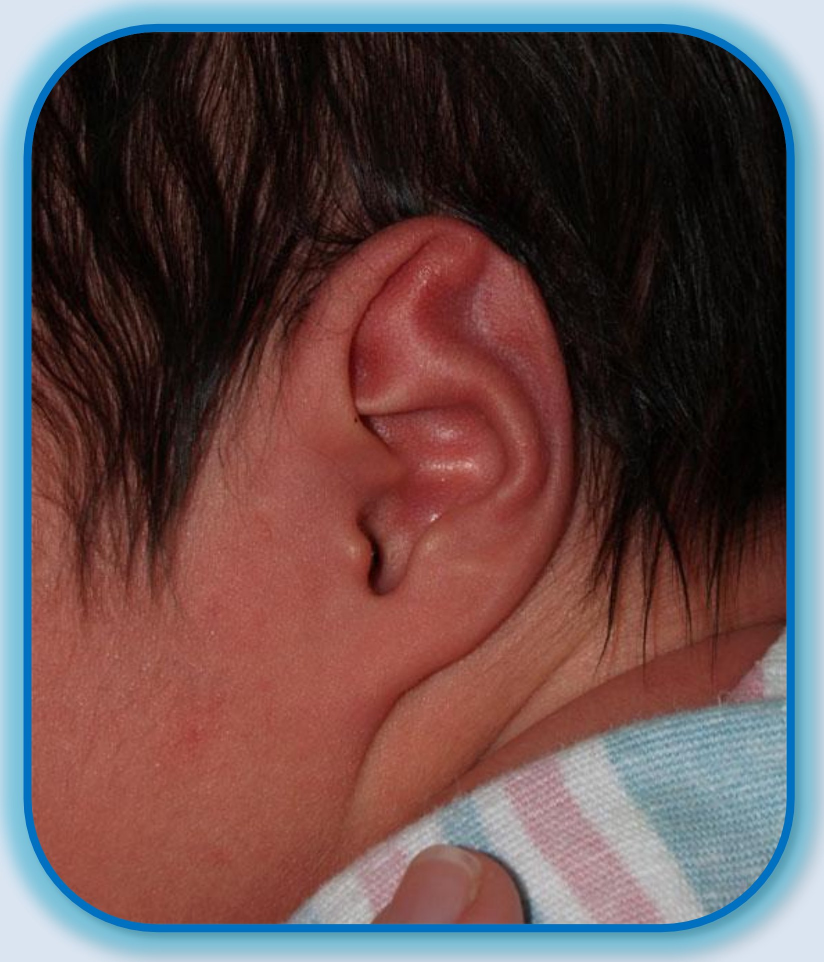
Ear pits (preauricular pits) are often a rather subtle finding on physical exam. They are located at the superior attachment of the pinna to the face and may be unilateral or bilateral. Up to **10% of Asian infants** will have pits (they are less common among caucasians and African Americans). There is a **rare association** between ear pits and **Brachio-Oto-Renal Syndrome** so **audiologic testing** of these infants is recommended, but otherwise this is considered a benign finding.

Ear Pit



Another example of an ear pit in a newborn. With an isolated pit, renal ultrasounds are not generally recommended unless there is a positive family history of deafness, renal pathology or auricular malformations, or when the mother has a history of gestational diabetes.

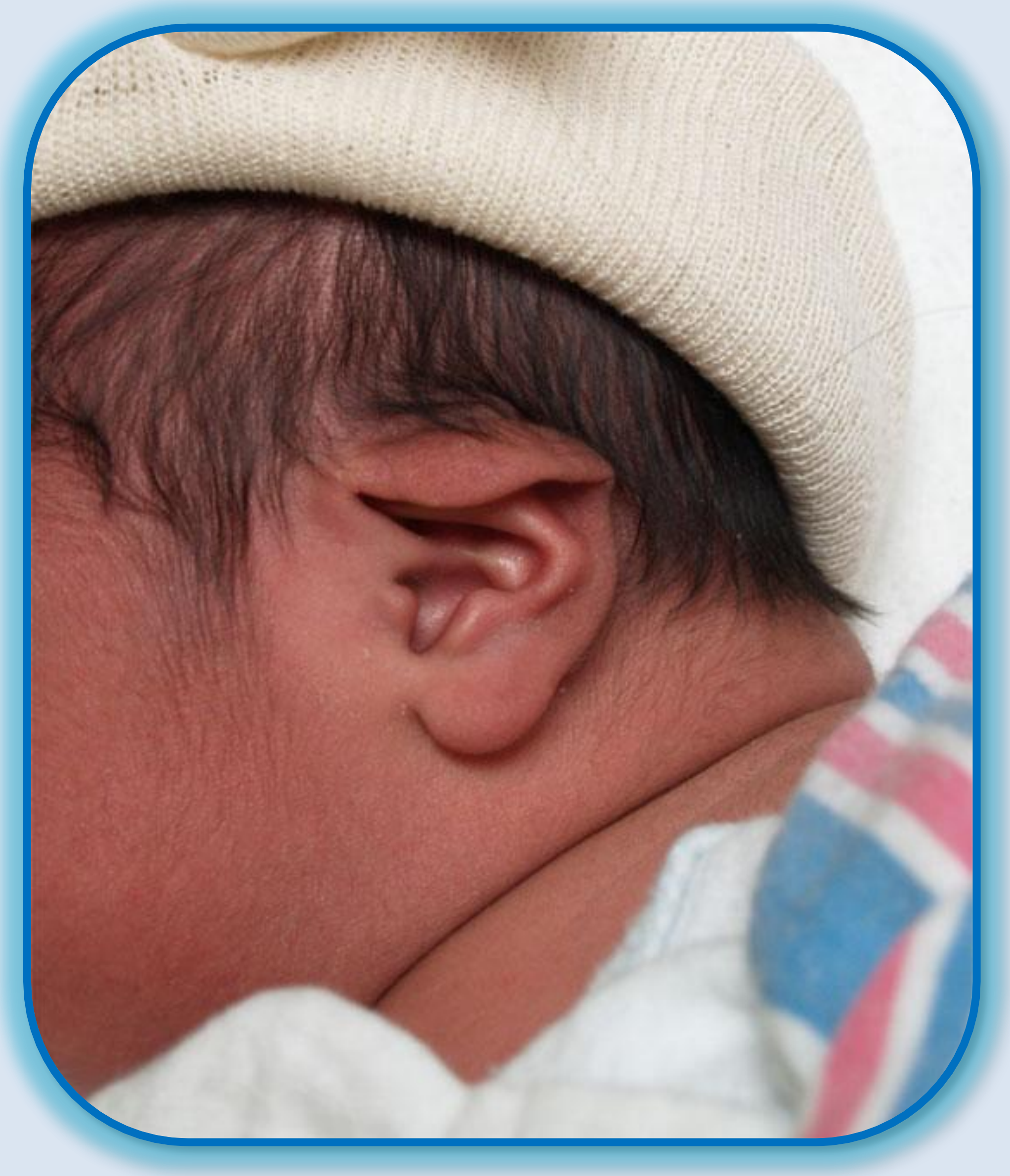
Stahl's Ear



Also known as **Satyr ear**, **Spock ear**, or **Vulcan ear**, this deformity of the pinna is characterized by a **flat helix at the superior pole** and a flattened scaphoid fossa.

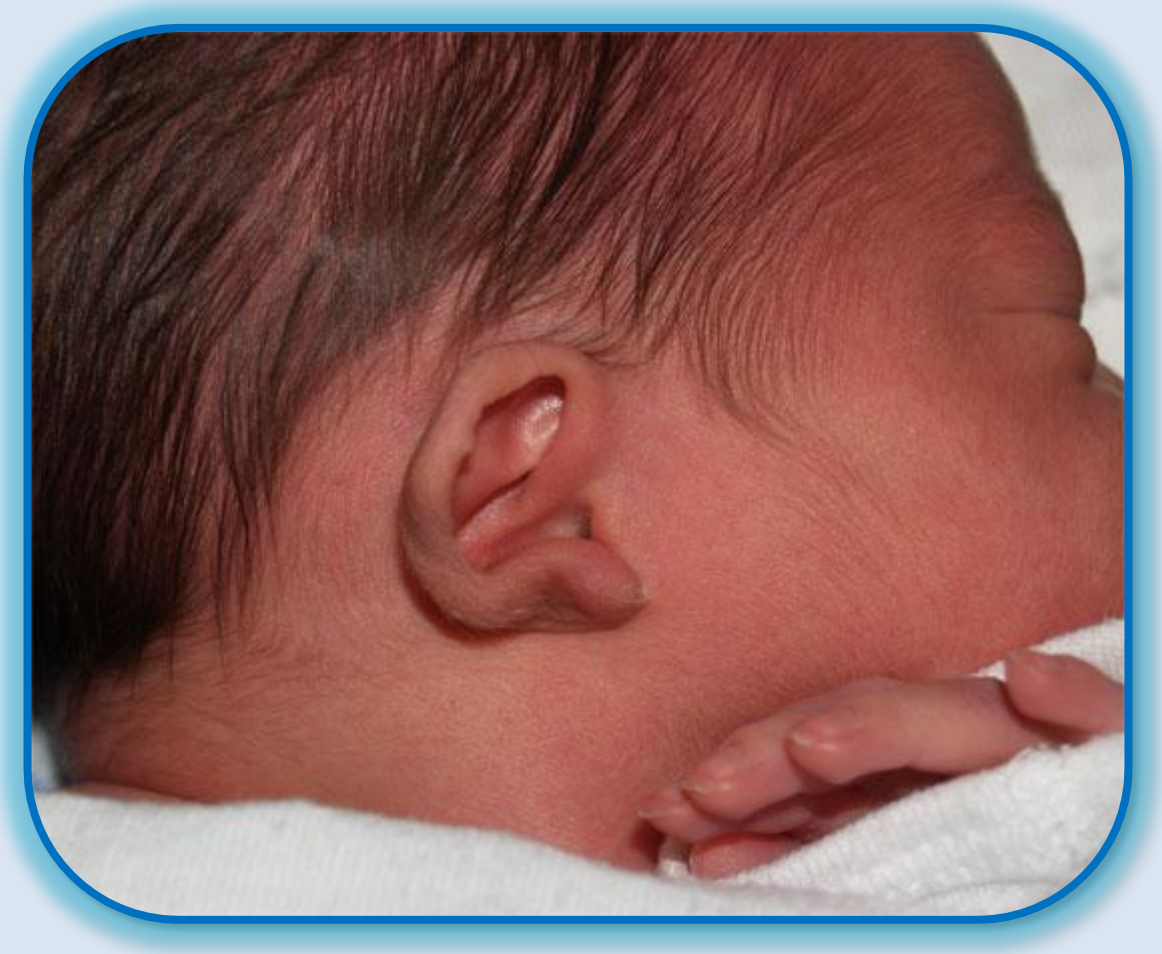
When this deformity is severe enough to be of cosmetic concern, splinting can be done. Exact etiology is unknown.

Lop Ear



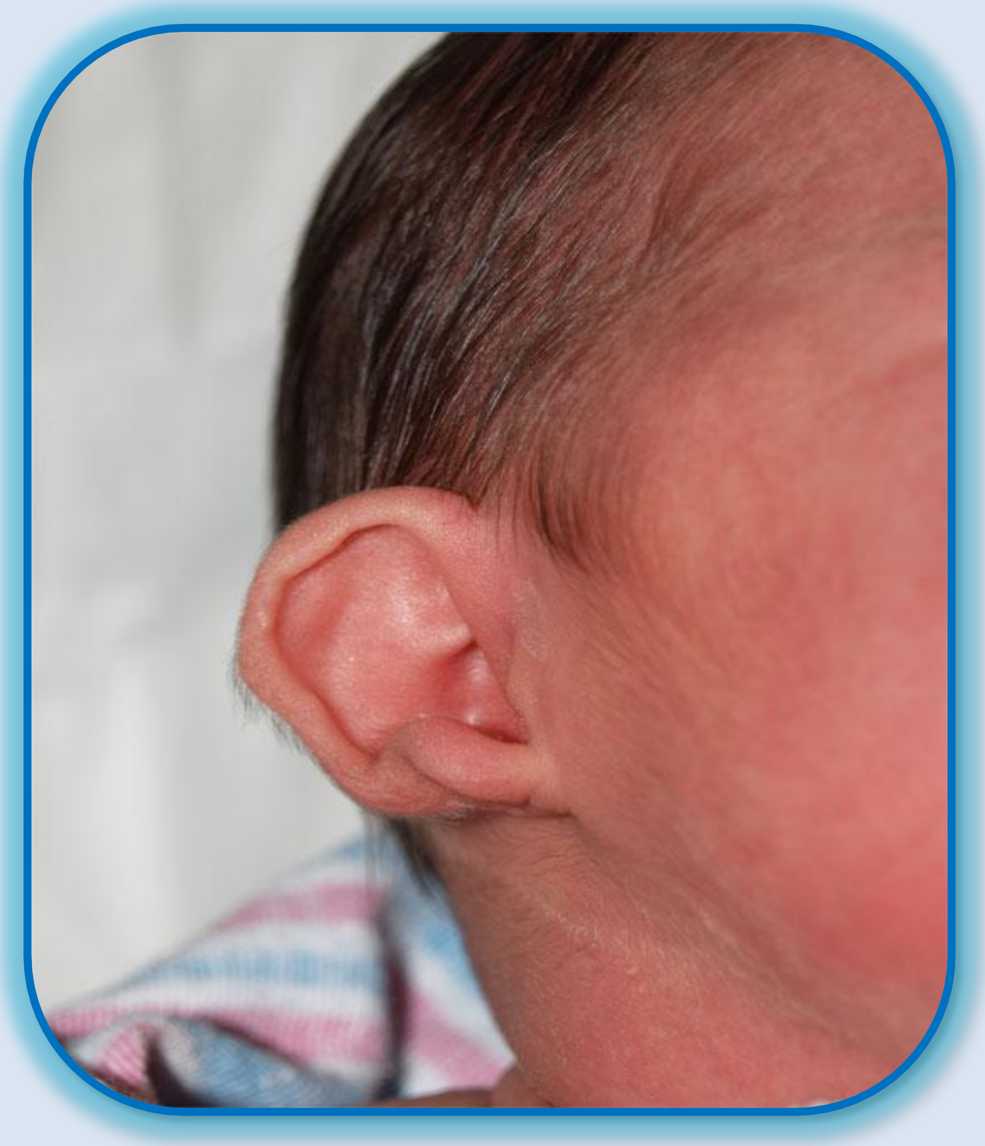
This **pinna deformity**, where the superior edge of the **helix is folded** down, is known as lop ear. Again, it is typically an **isolated** finding. This is another deformity that may be improved with **splinting**.

Cup Ear



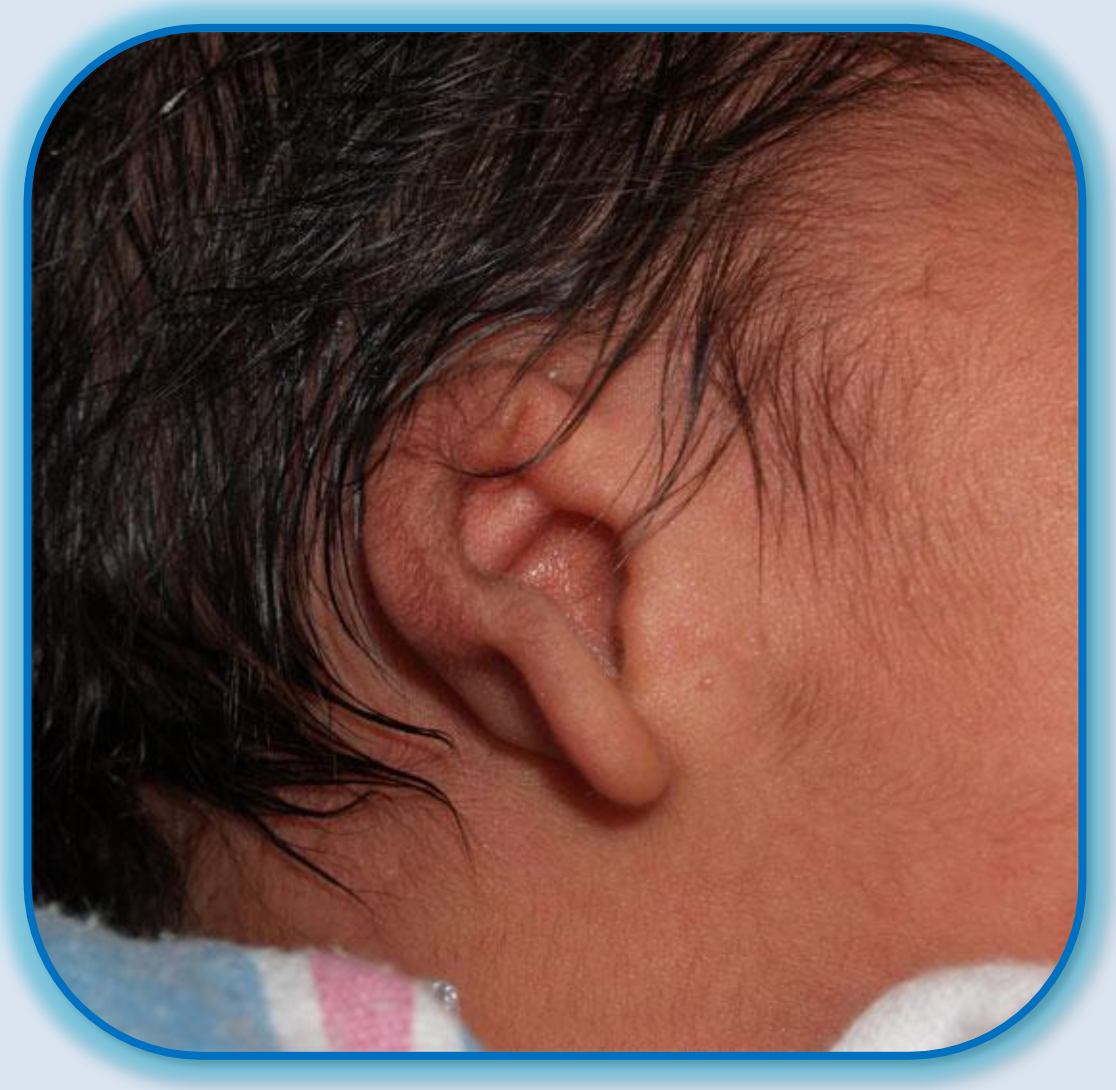
Also known as **"prominent ear"**. In the absence of other abnormalities on physical examination, this finding is only of cosmetic concern. When severe, corrective surgery can be done.

Cup Ear



As an isolated finding, this ear shape does not require any further evaluation.

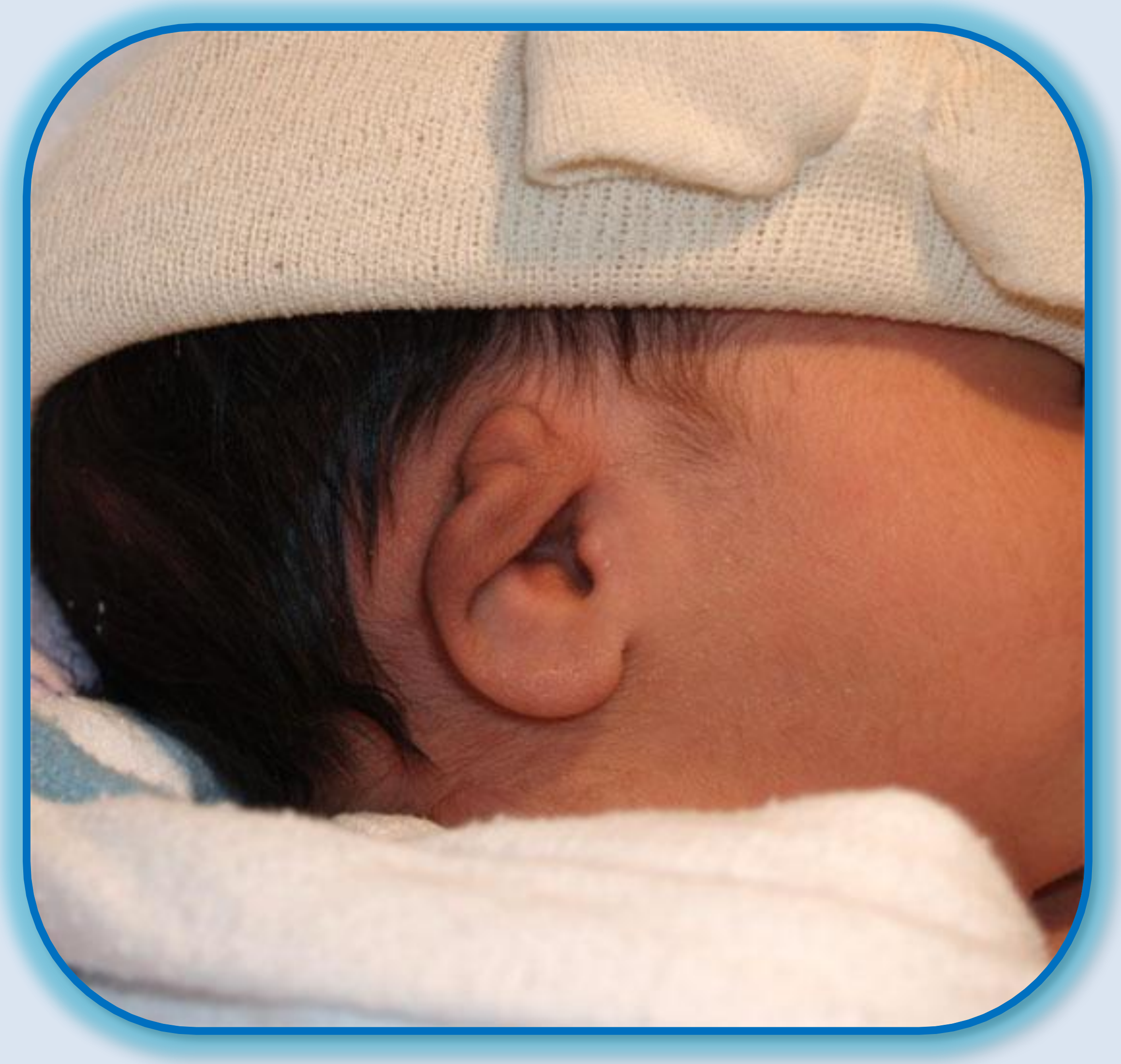
Microtia



In contrast to the previous photos, this pinna is **not well-formed** and is smaller than a normal ear. This is microtia, class II. **Hearing evaluation is mandatory** in these infants.

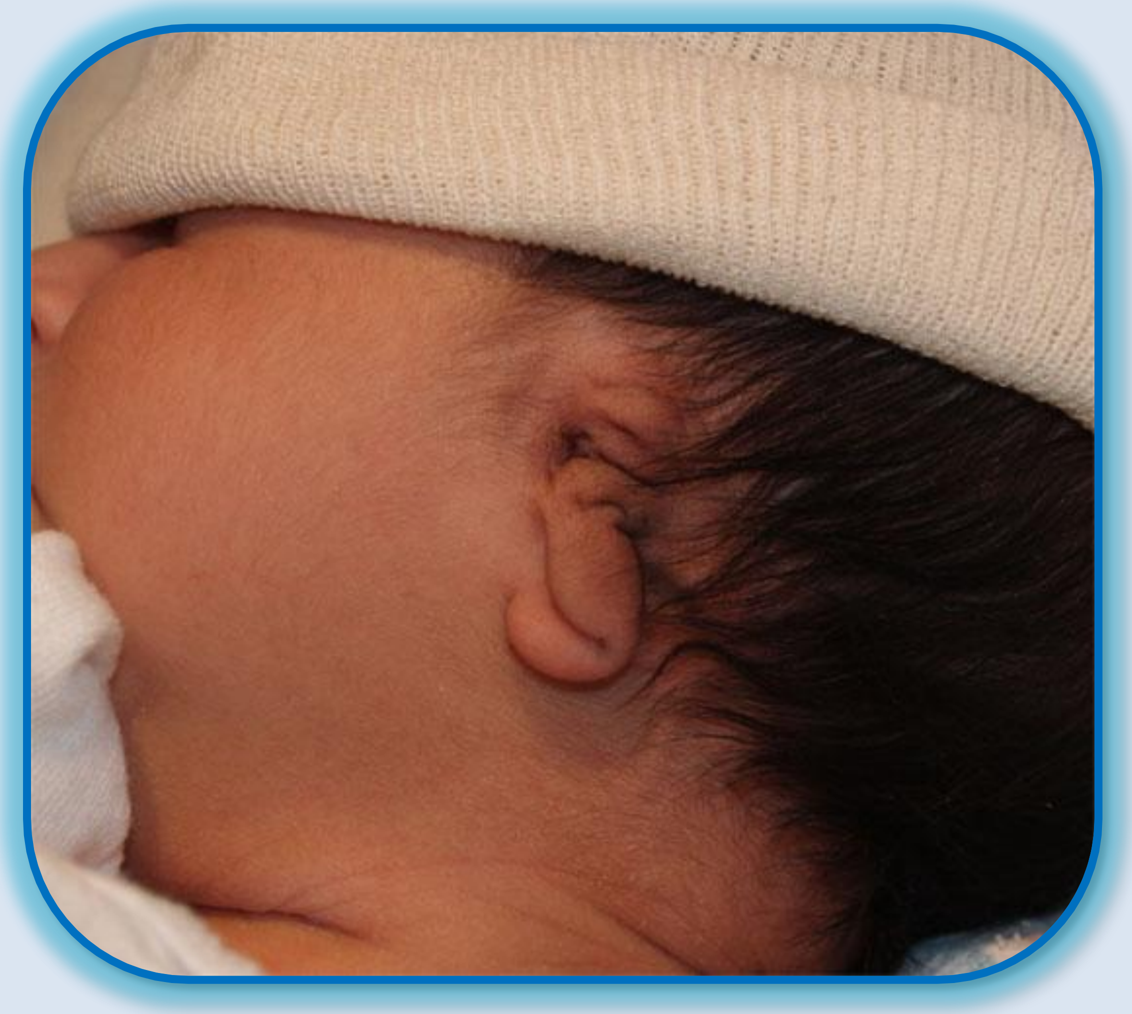
Fortunately, this infant was found to have normal hearing. Elective cosmetic repair was planned.

Microtia



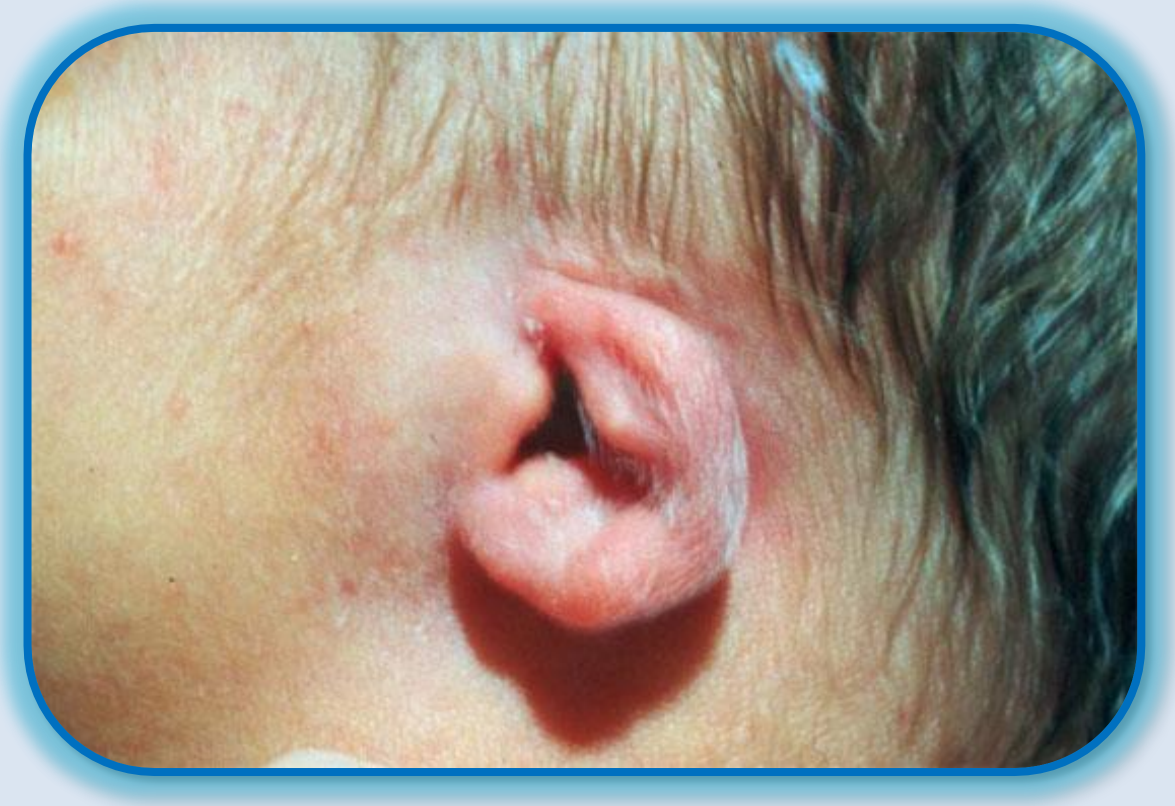
Here is another example of microtia. This infant was also diagnosed with class 2 microtia, which was additionally labeled **"locked ear deformity"**. The internal structures of the ear were normal, and apart from bilateral ear abnormalities, the remainder of the physical examination, and a renal ultrasound, were normal.

Microtia



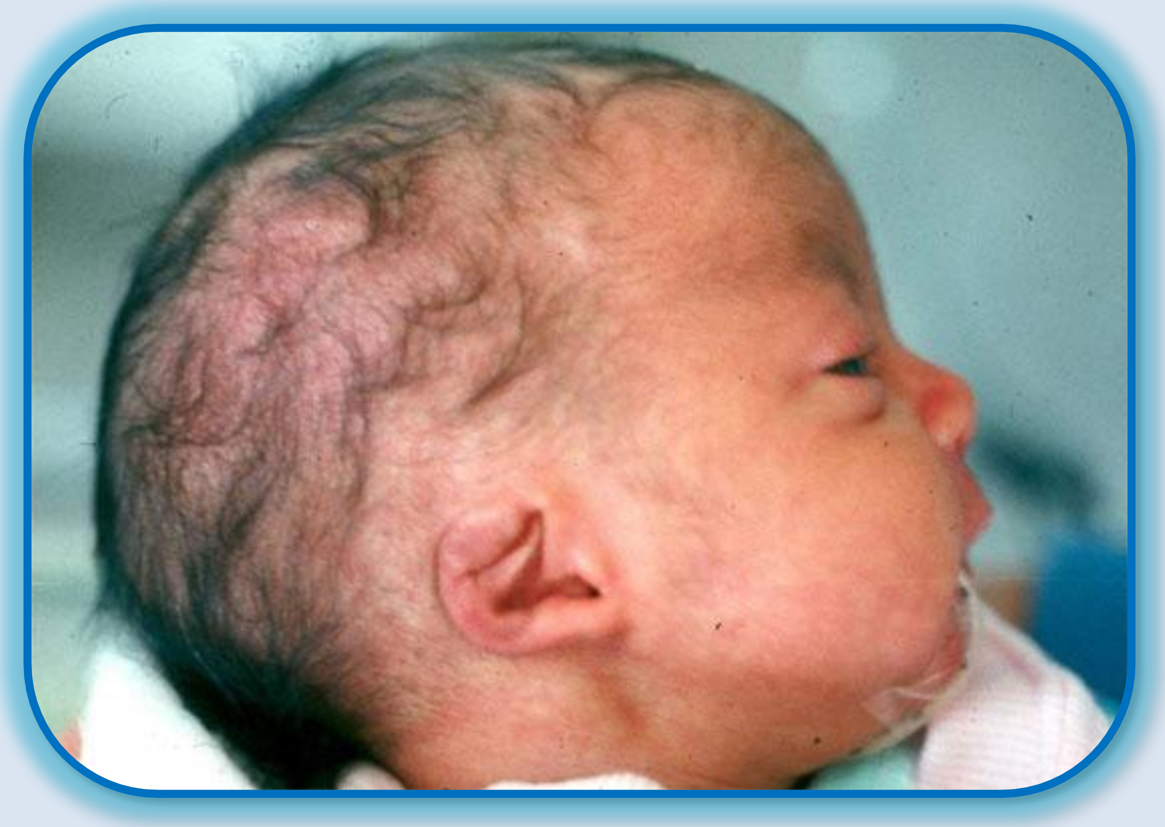
This microtia is **more severe** than the previous examples. This is lobular microtia, class 3, with **atretic ear canal** and the pinna appeared very poorly developed. Approximately **half** of all babies with microtia will have an **underlying congenital syndrome**, so careful assessment for associated abnormalities (in addition to **hearing loss**) should be undertaken.

Hypoplastic Ear



Here is another infant with auricle malformation. The ear is hypoplastic and low set. Again, because **genetic syndromes are frequently associated with abnormal ear shapes**, a careful physical examination should be performed. Even in the absence of other findings, referral to a pediatric ENT specialist may be indicated, as an abnormal pinna may be an indicator of internal ear abnormalities.

Low Set Ear



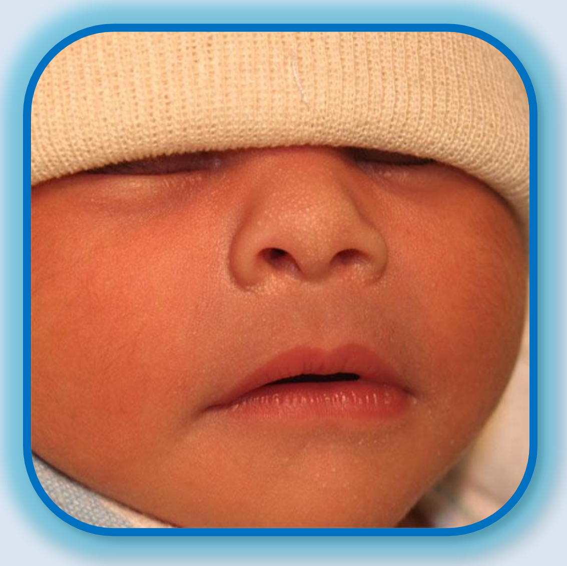
Here, the low set position of the ear (also hypoplastic) can be appreciated.

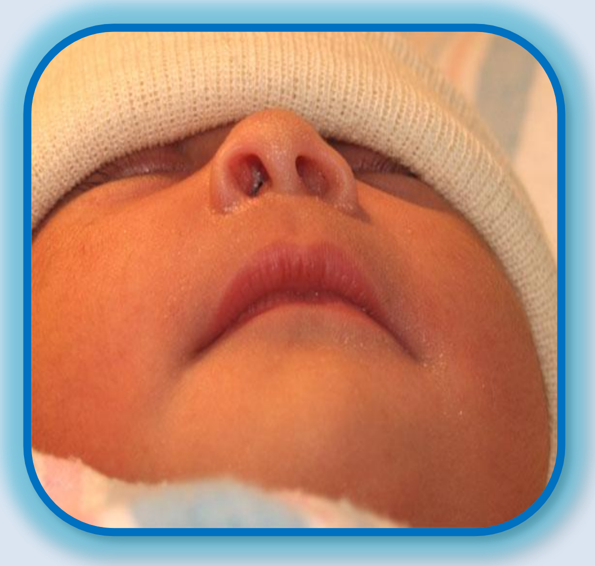
If an imaginary line is drawn from the outer canthus of the eye straight back to the occiput, a low set ear will fall completely below the line. A normal set ear will cross or touch the same line.

This infant had trisomy 18 as an underlying etiology.

Nose

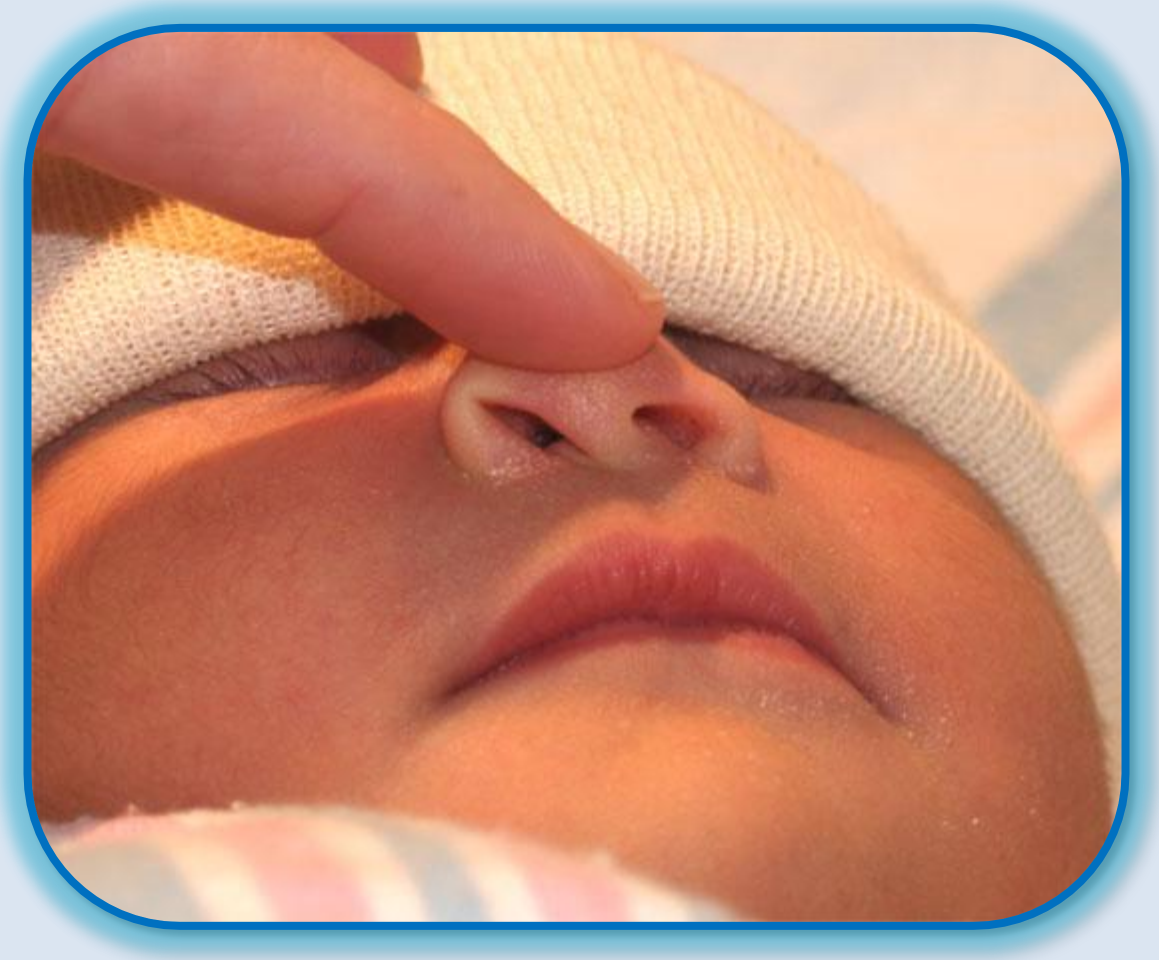
Positional Nasal Deformity





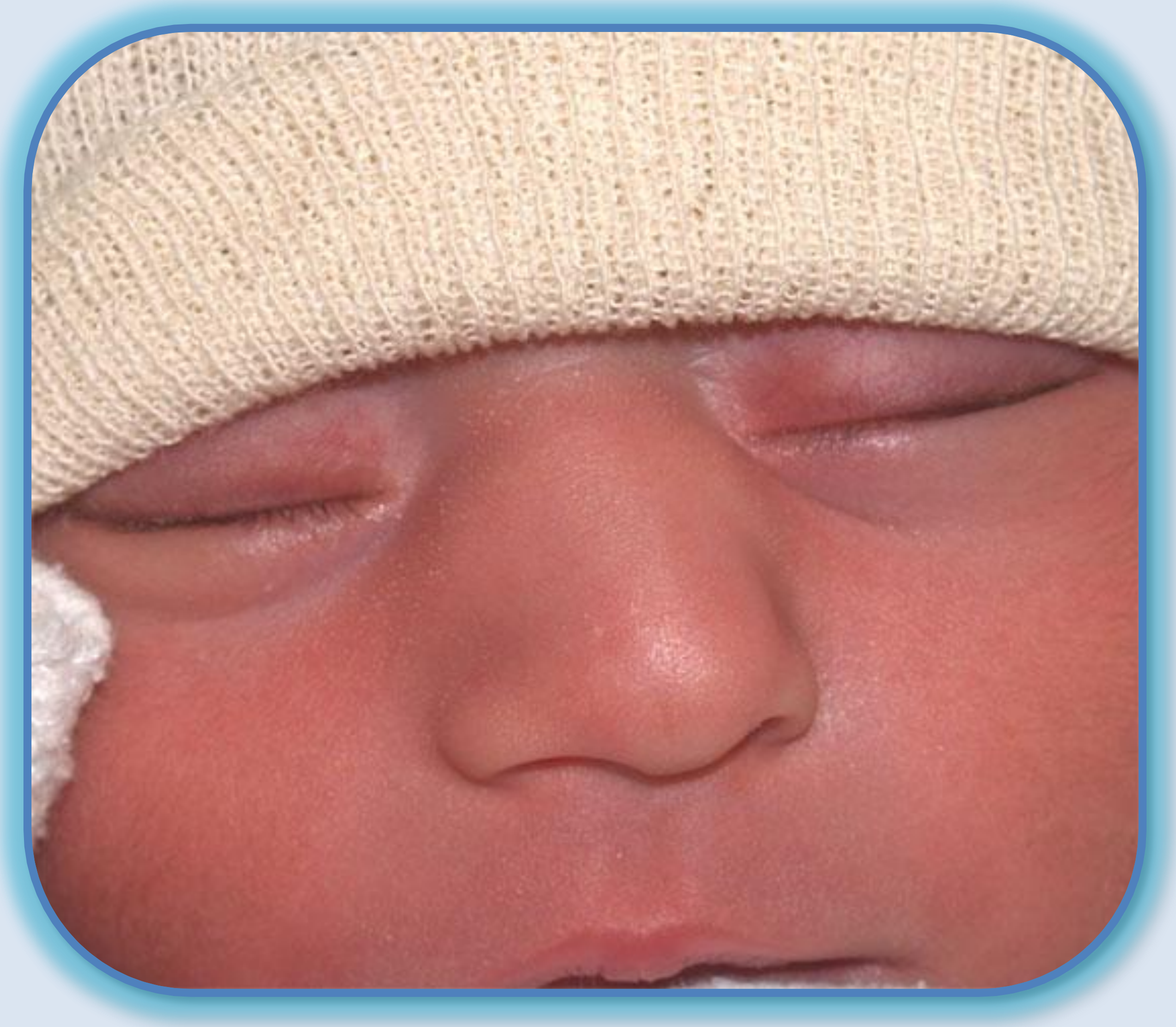
An occasional finding on physical exam is an **asymmetric** appearance of the nose due to a positional deformity. Most likely, this results from an unfortunate **position *in utero***. The nares in this case are asymmetric and slightly flattened towards the infant's right, even though the septum is still centrally located with angulation of the septum.

Positional Nasal Deformity



With compression of the nasal tip, the septum becomes even more angled, raising concern for septal dislocation, but the base is still centrally located.

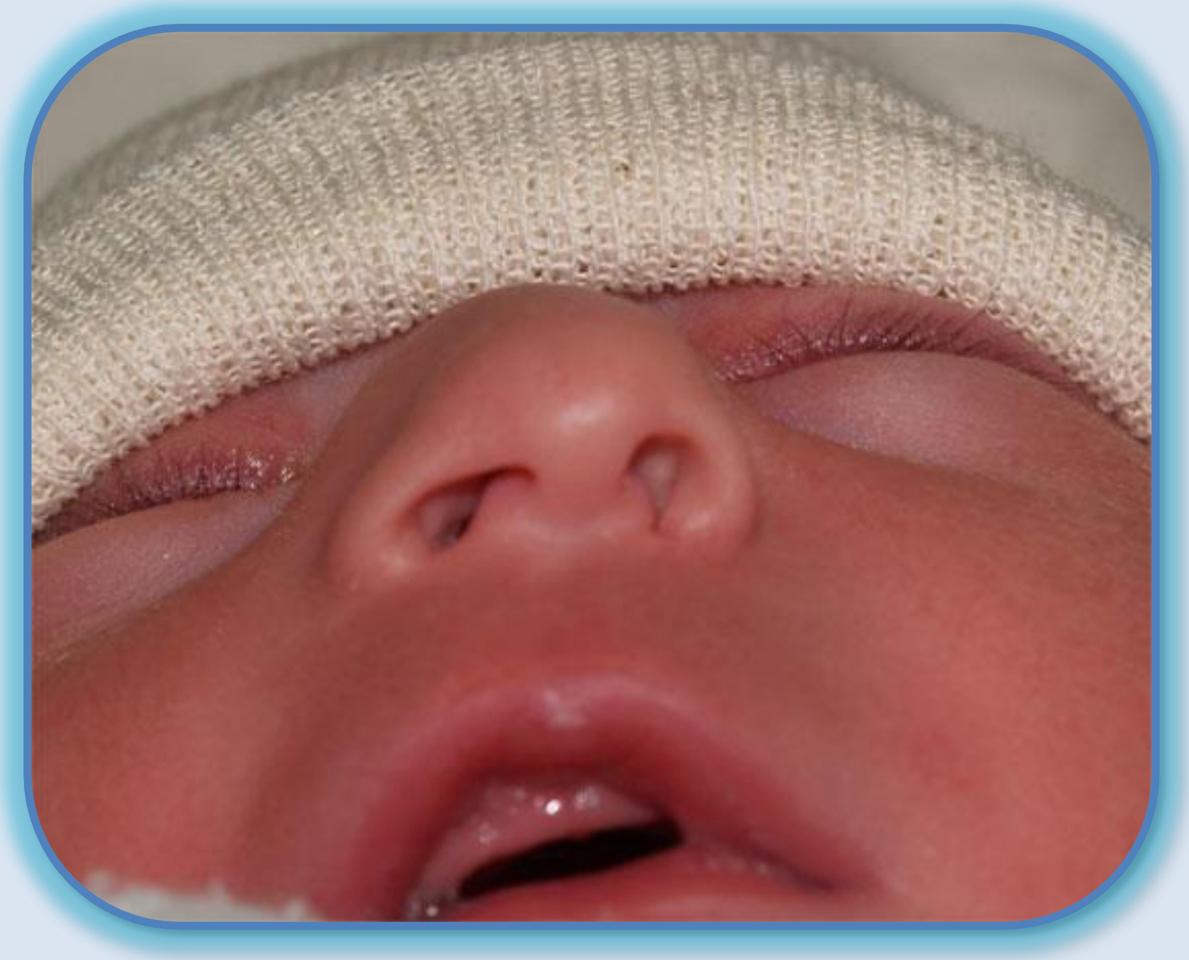
Dislocated Nasal Septum



The vertical axis of the nose deviates to the infant's left. With positional deformity, the nares may look asymmetric, but the nose itself is straight.

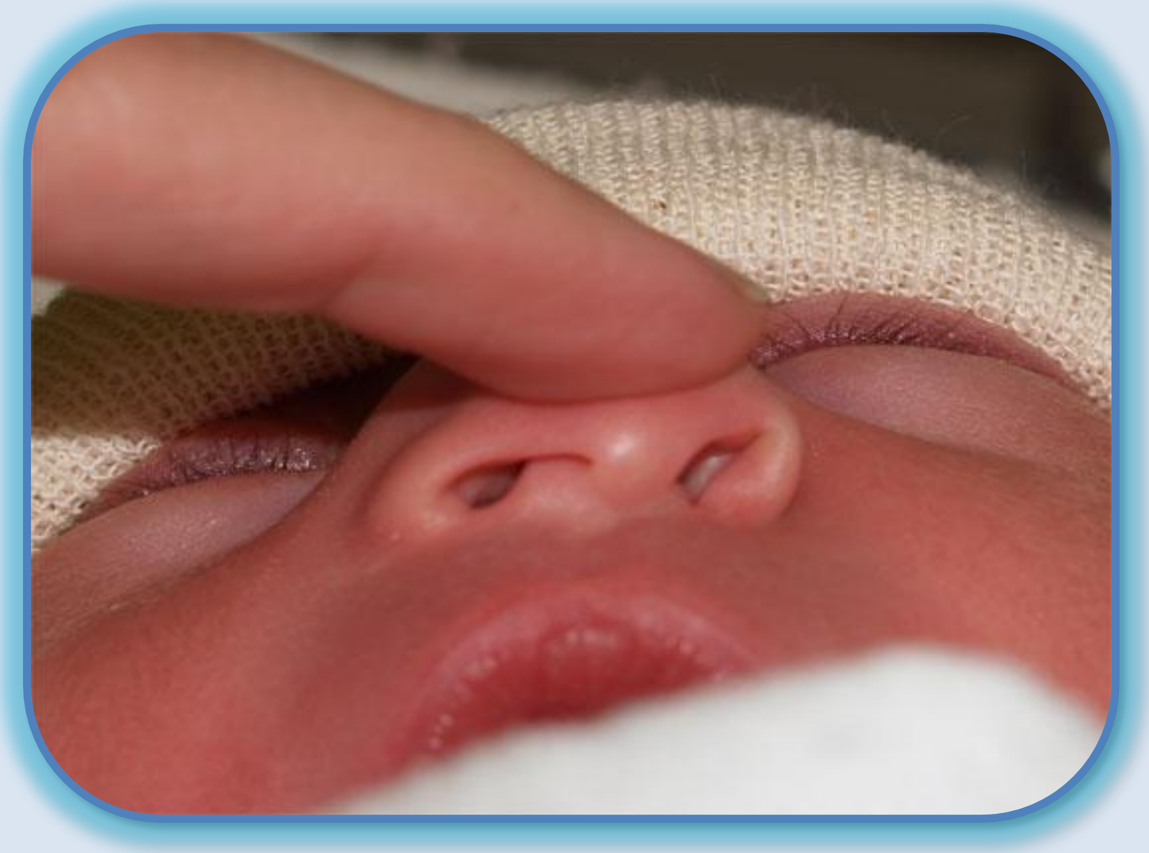
Dislocated nasal septum can result in permanent deformity if not corrected so early referral is mandatory.

Dislocated Nasal Septum



From this view, the deformity is more easily seen. The septum is not straight and the whole bottom segment of the nose appears to be shifted to the baby's left.

Dislocated Nasal Septum



When the tip of the nose is compressed gently in the presence of a dislocated septum, the deformity appears to worsen. In this photo, the tip of the nose is actually beside the base of the septum.

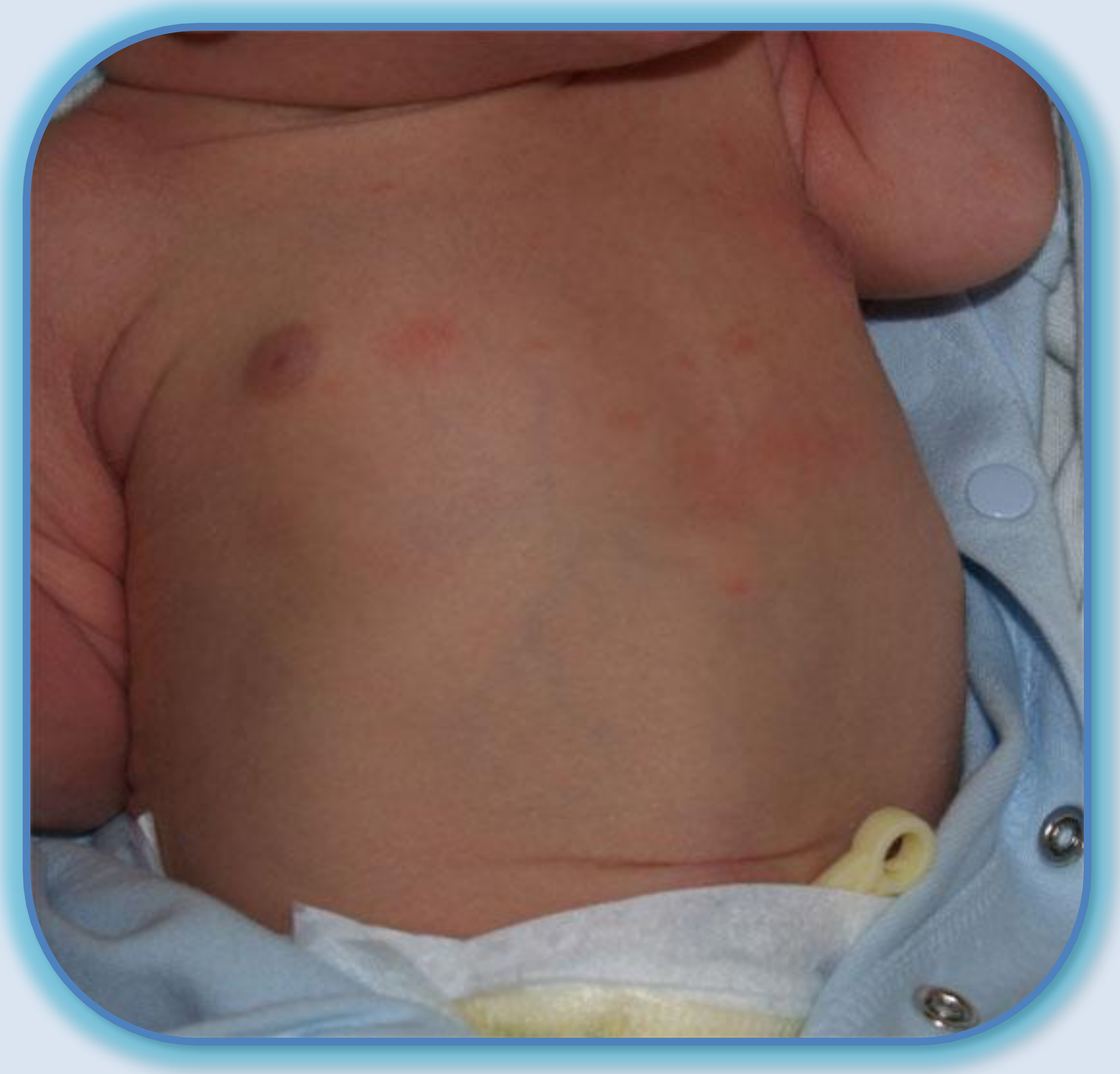
With positional deformity, the septum would stay straight, even if the nares appear uneven.

Incidence of dislocated septum is about 4%.

An experienced pediatric otolaryngologist can relocate the septum easily, without surgery, if consulted early (within the first few days of life), so recognition of this condition and timely referral is important to prevent permanent deformity.

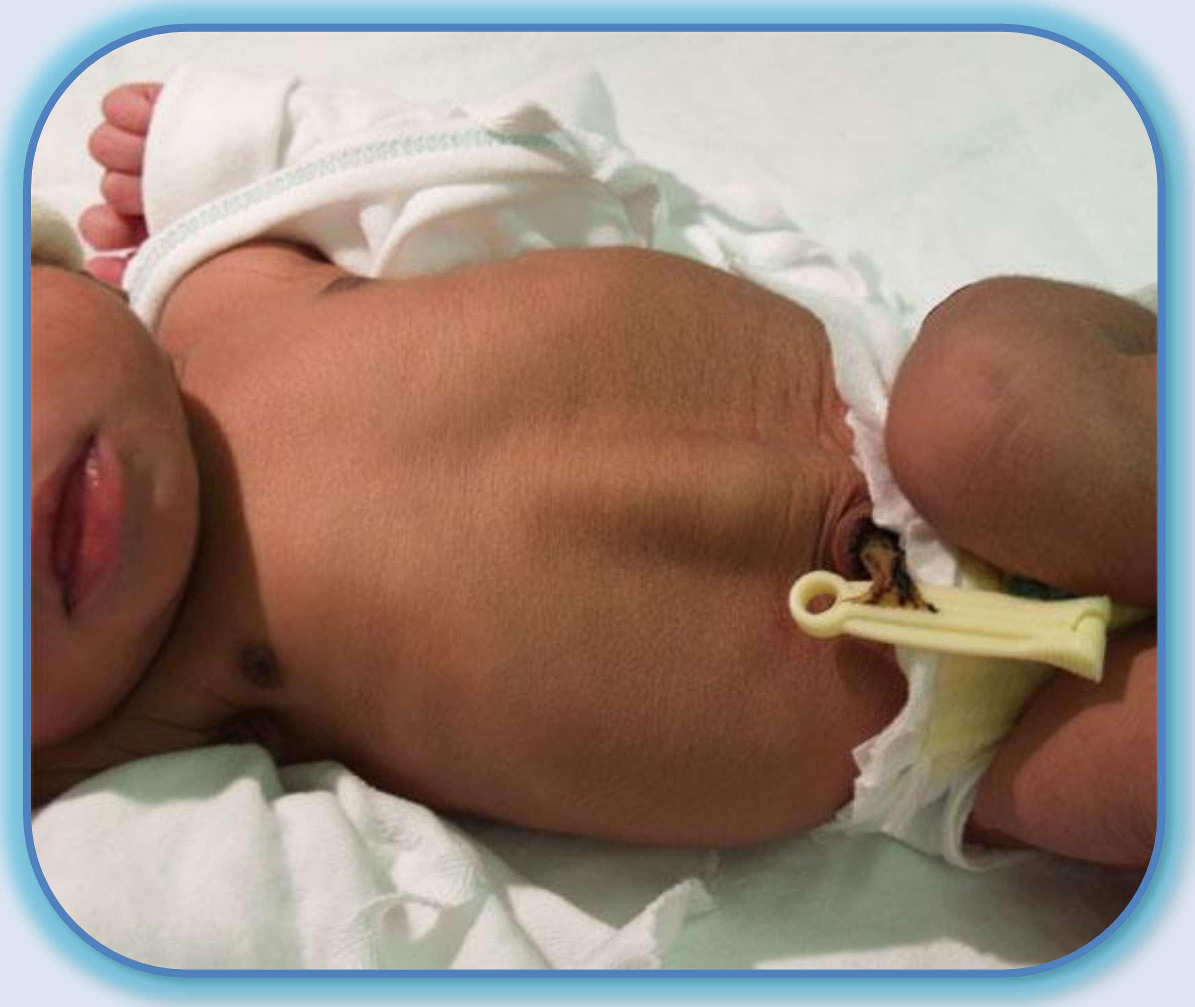
Abdomen

Diasatsis Recti



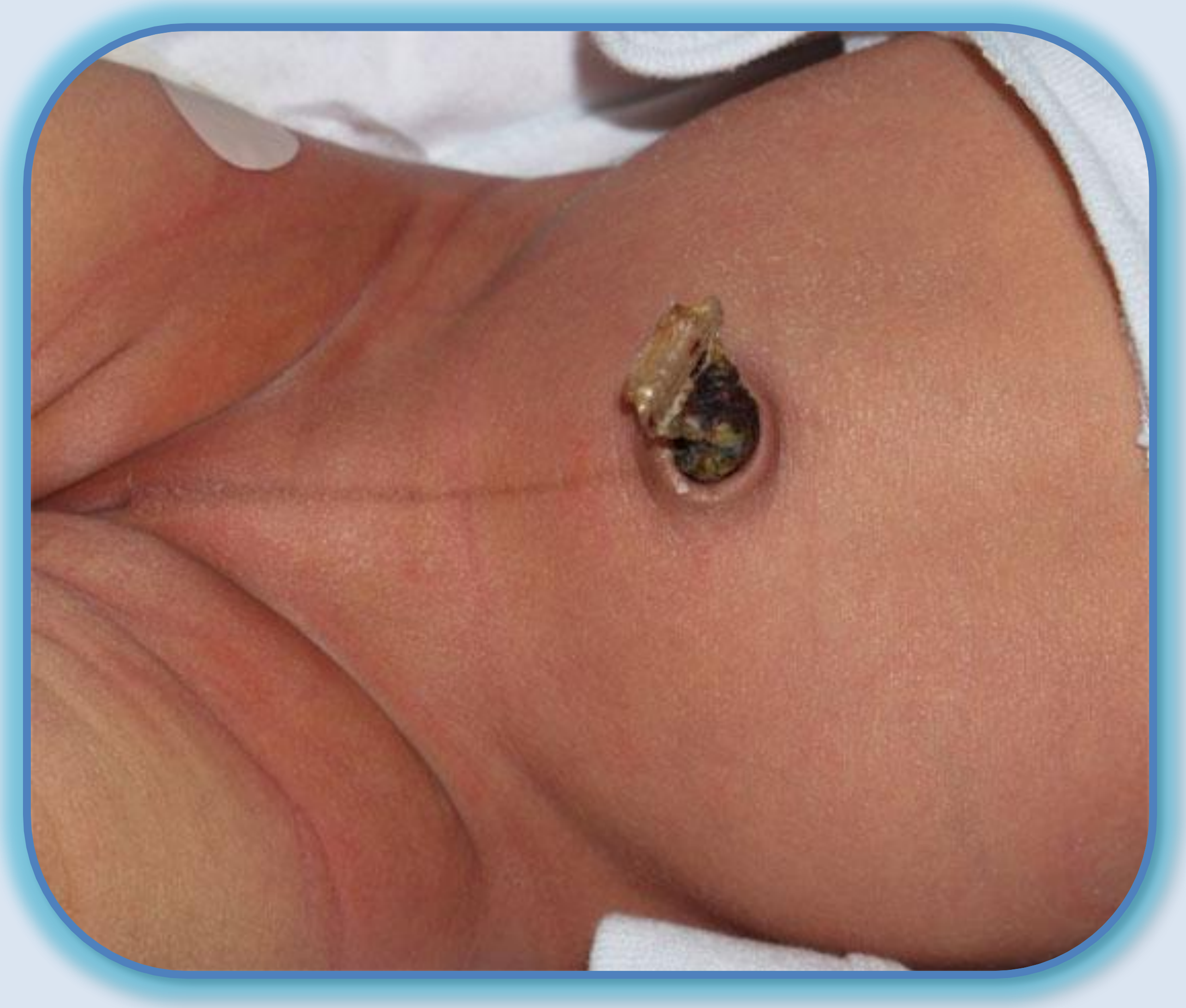
A **vertical bulge** down the **midline** of the abdomen can be seen in many newborns when intra-abdominal pressure increases. Diastasis recti is caused by a relative **weakness** of the **fascia** between the two rectus abdominus muscles. It is **not** a herniation and is not pathologic. With time, this will disappear.

Diasatsis Recti



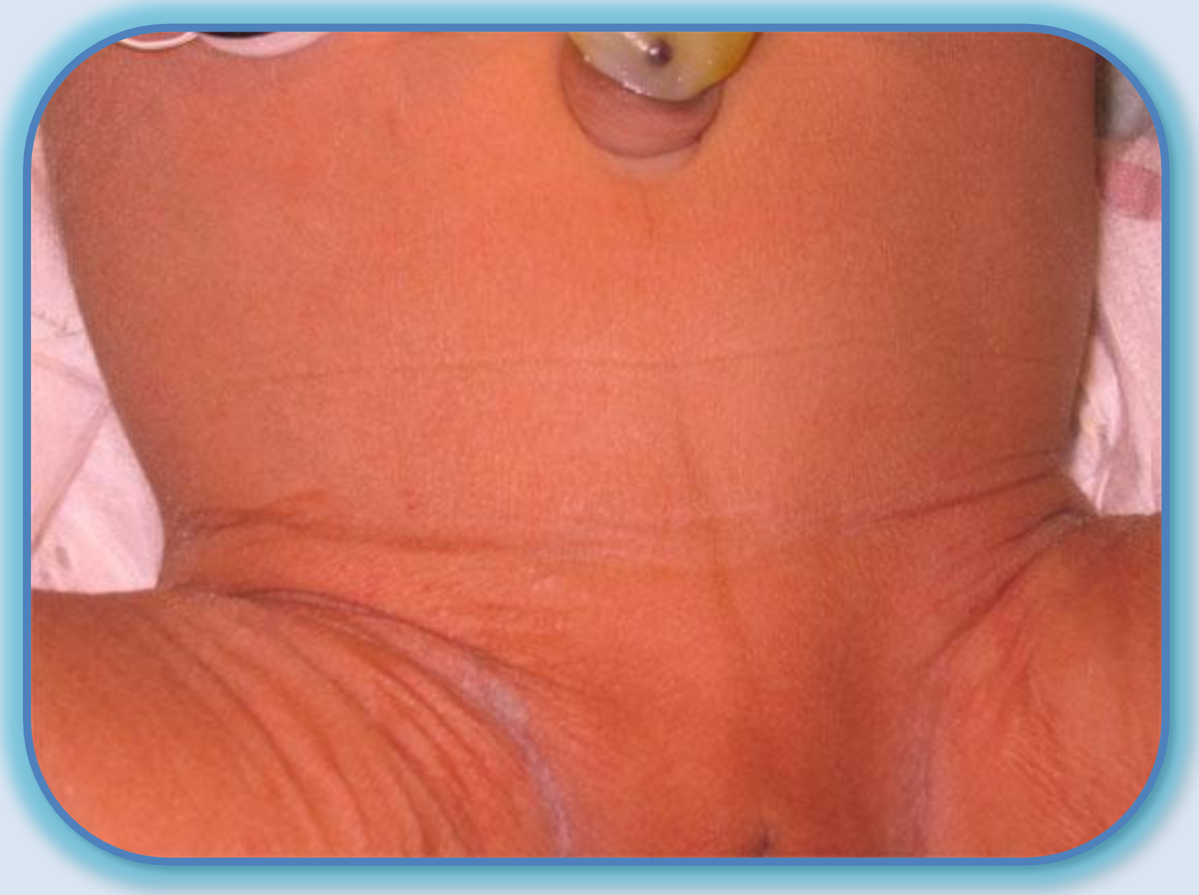
Another newborn has more pronounced diastasis recti. Spontaneous resolution is still expected.

Linea Nigra



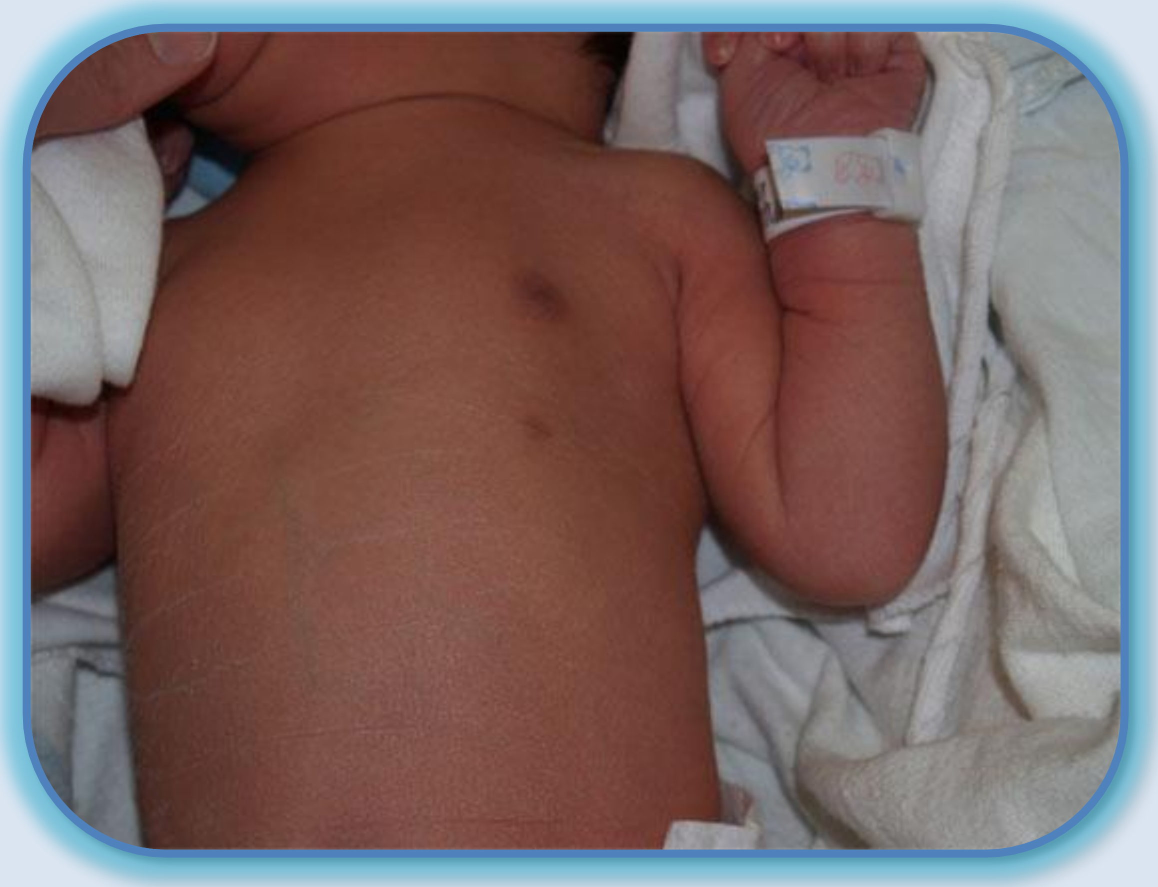
The **dark line** down the **midline** in this baby is a linea nigra. It is a fairly **common** finding in newborns, especially those with more pigmented skin. The presence of linea nigra seems to be impacted by hormonal levels, as this finding is often seen is pregnant women as well. It is completely **benign**.

Linea Nigra



Here is another example of linea nigra. The line is more faint, but the appearance of a midline stripe between the umbilicus and the pubis is diagnostic.

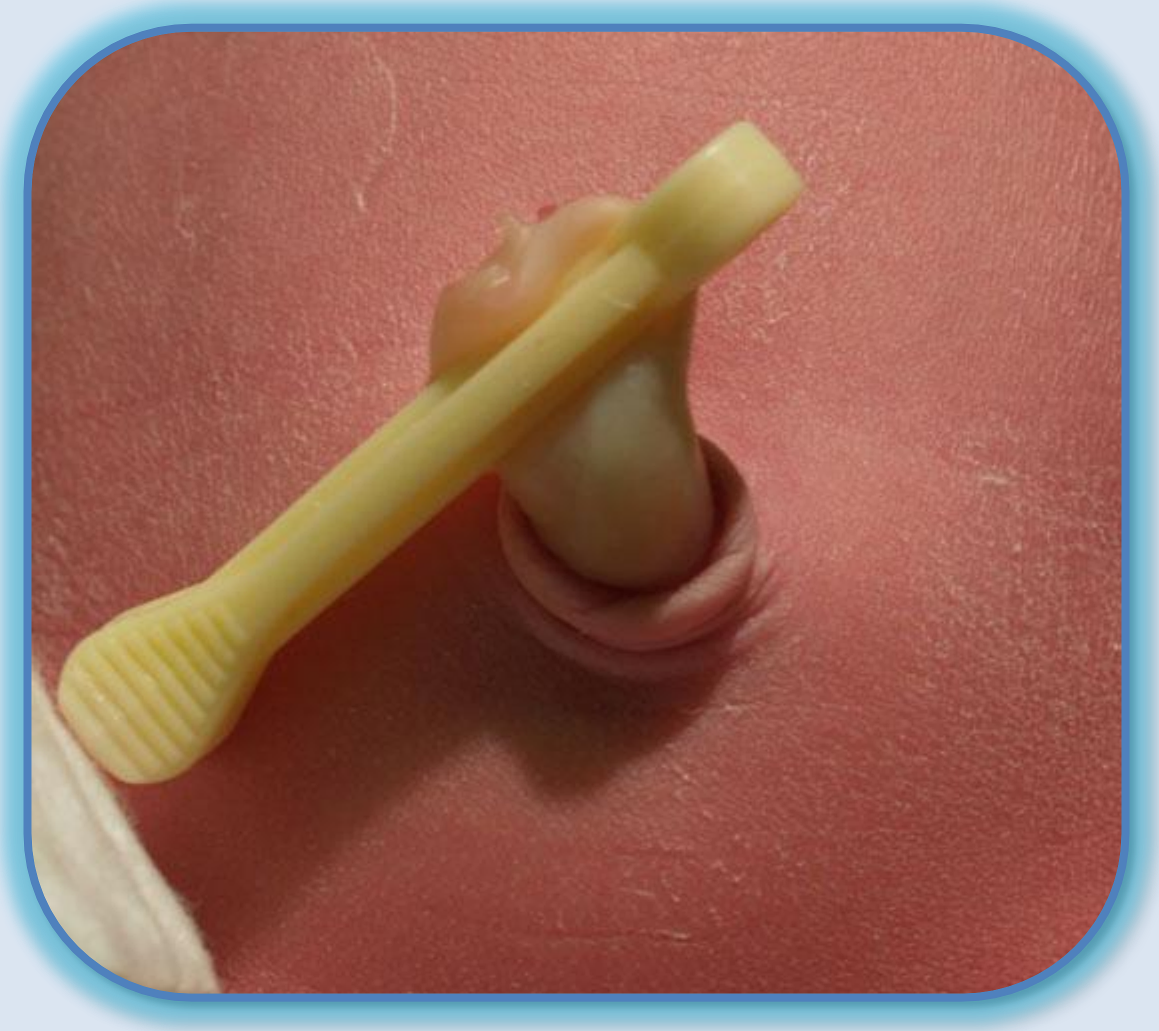
Supernumerary Nipple



The brown macule below the left nipple in this infant is a supernumerary nipple. Found along the **"milk lines"** they may be **single or multiple**, **unilateral or bilateral**. It is an **insignificant** finding.

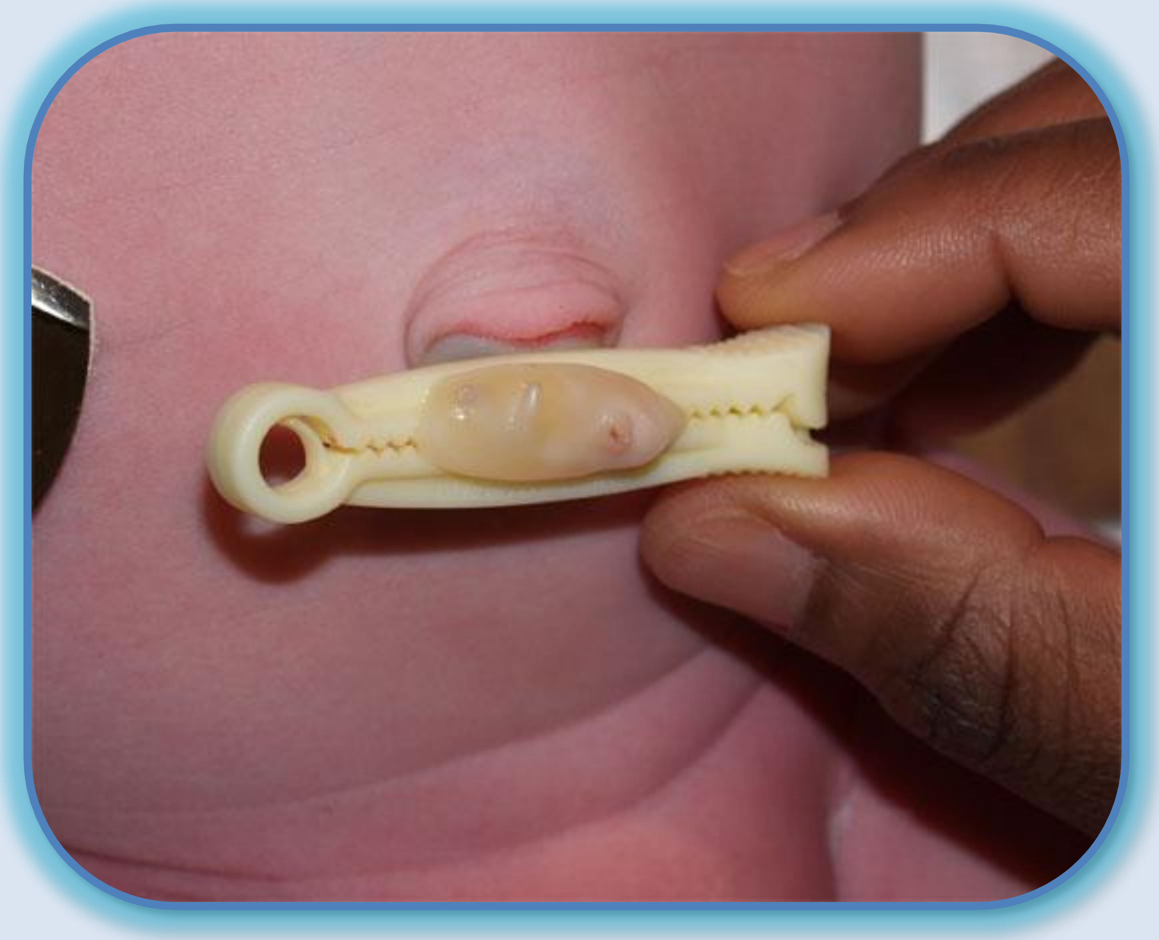
Umblical cord

Normal Umbilical Cord



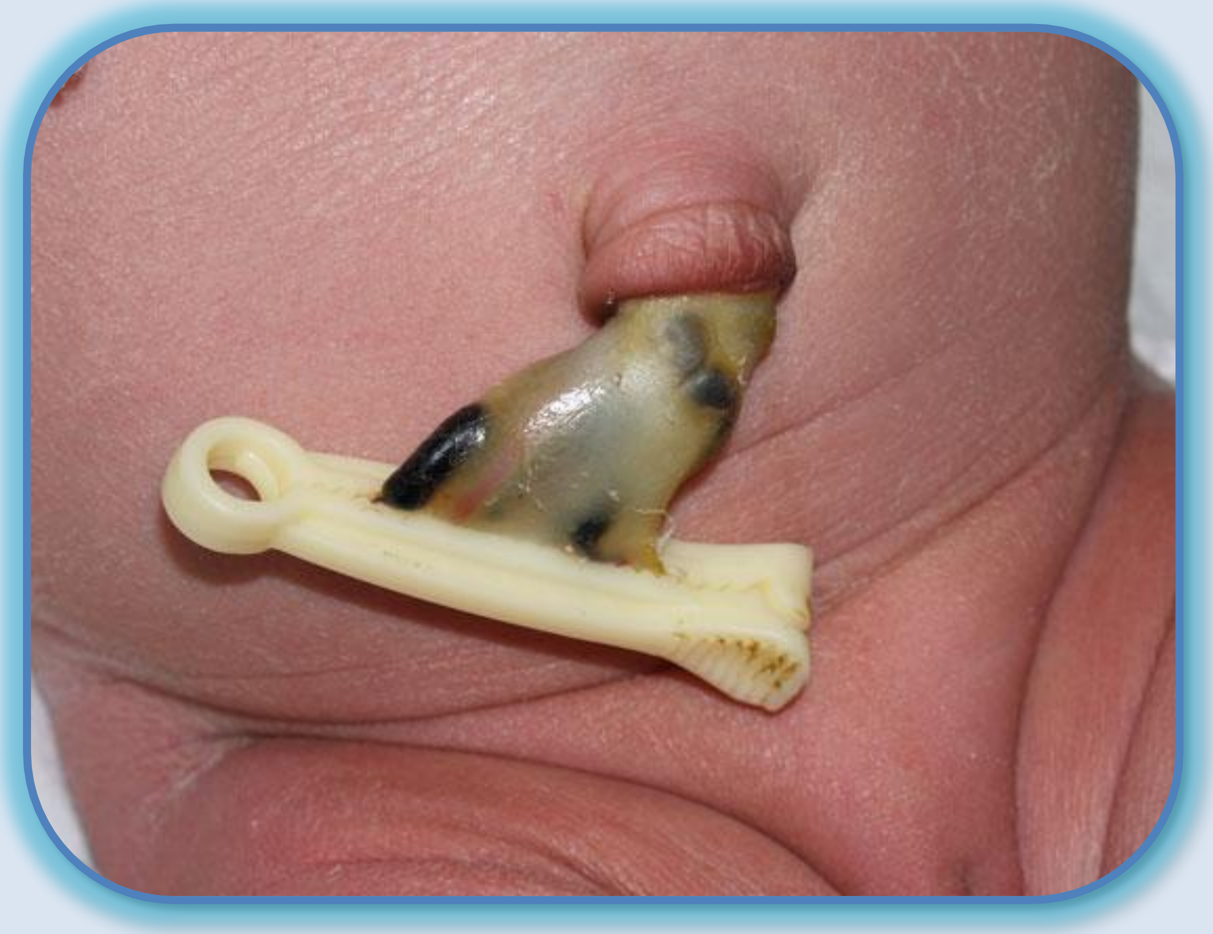
This infant is 7 hours old. The cord is plump and pale yellow in appearance. A normal cord has **two arteries** (**small**, round vessels with thick walls) and **one vein** (a **wide**, thin-walled vessel that usually looks flat after clamping).

Normal Umbilical Cord



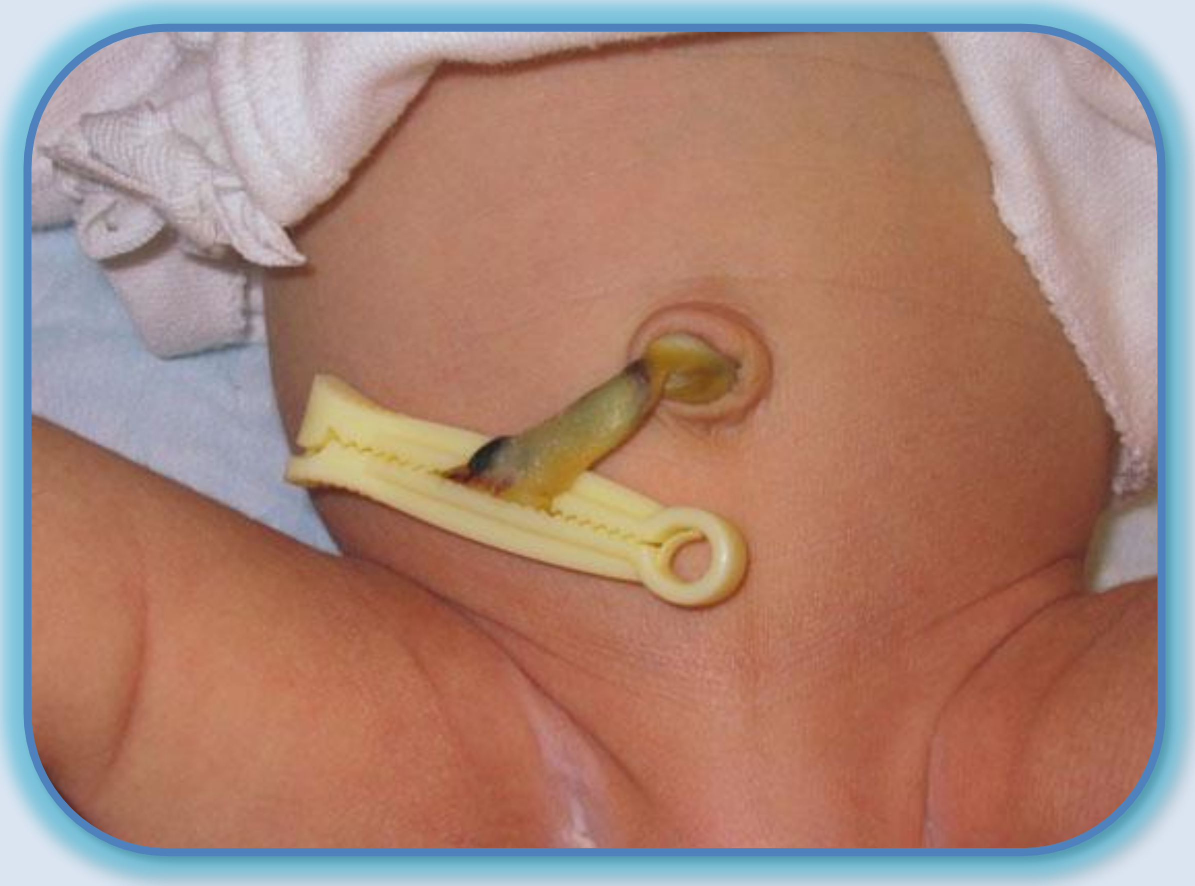
Looking at the cut edge more clearly shows the **normal vessels** of the umbilical cord. The two arteries are to the left and the vein, with a spot of blood in its large lumen, is on the right.

Normal Umbilical Cord



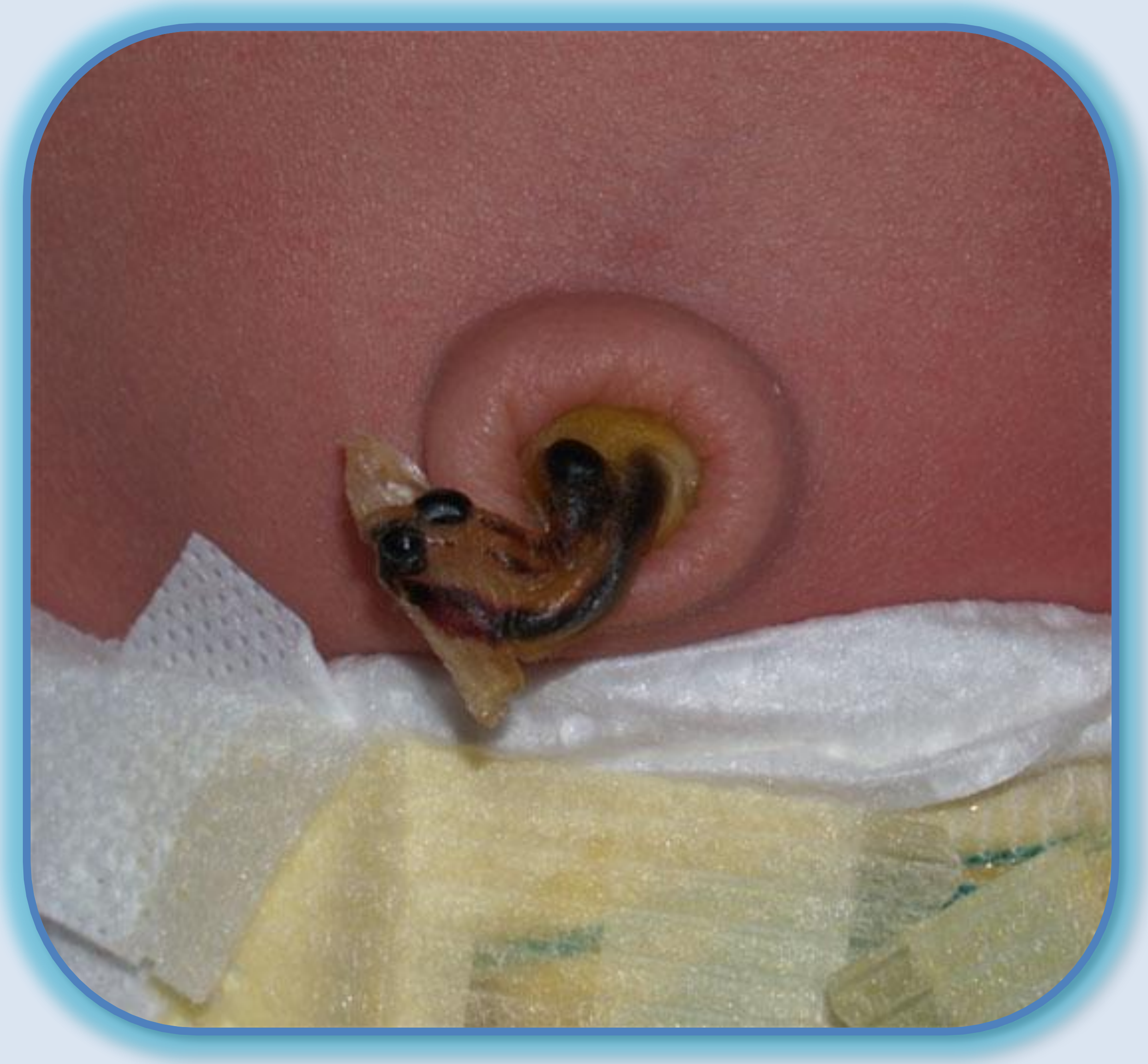
The **dark stripes** within the cord in this picture are examples of intravascular **clots** (a normal finding in newborns). In some cases, the vessels are so full of clotted blood that all three may be clearly identified as they wind around through the umbilical stump.

Normal Umbilical Cord



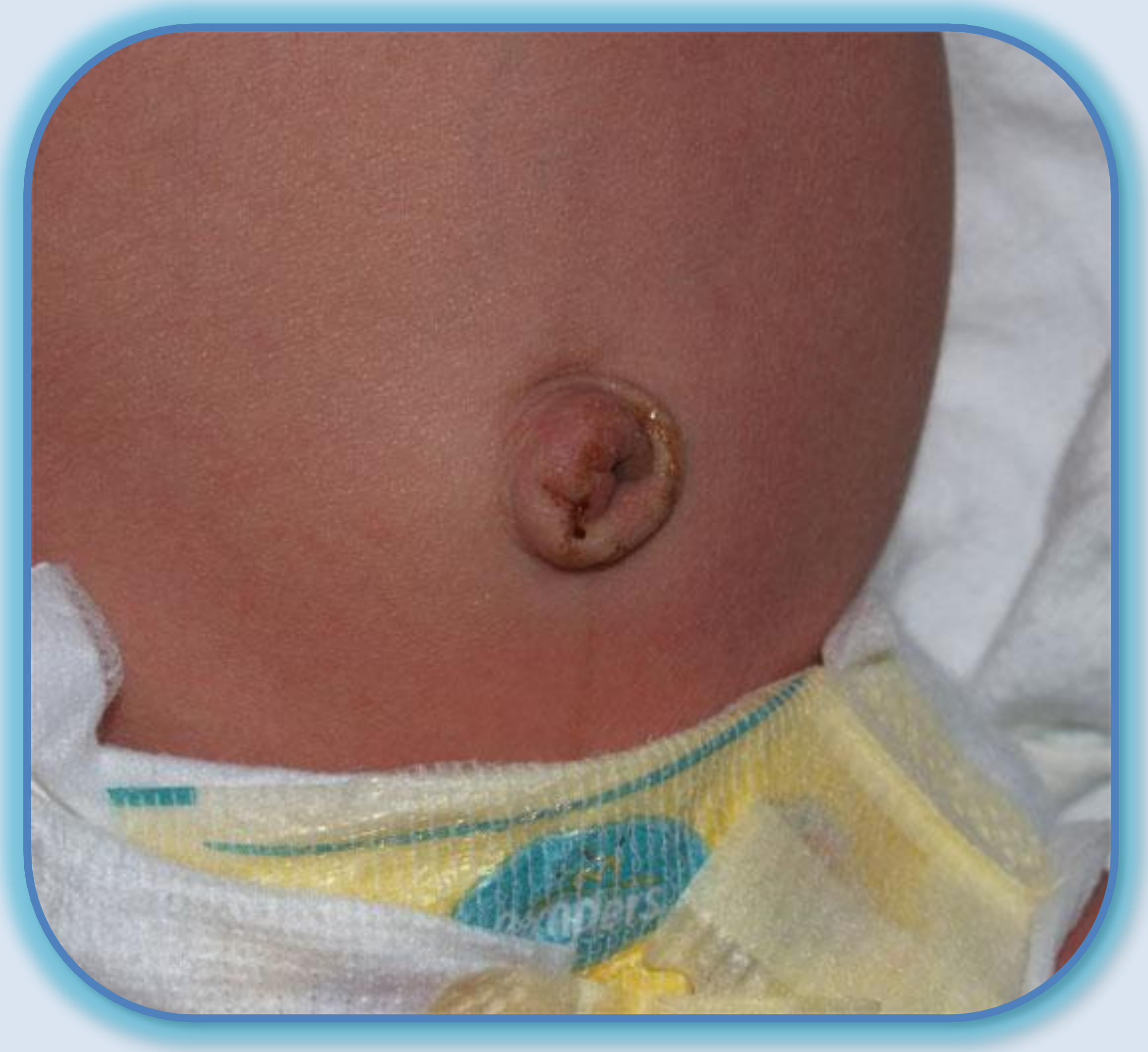
This infant is 19 hours old. The cord is **beginning to dry and darken** as it makes its transition into a non-functioning organ.

Normal Umbilical Cord



After a couple of days, the cord is a **stiff, dry stump**. The **bulge of skin** around the edge is a **normal** variant and does not represent an abnormality.

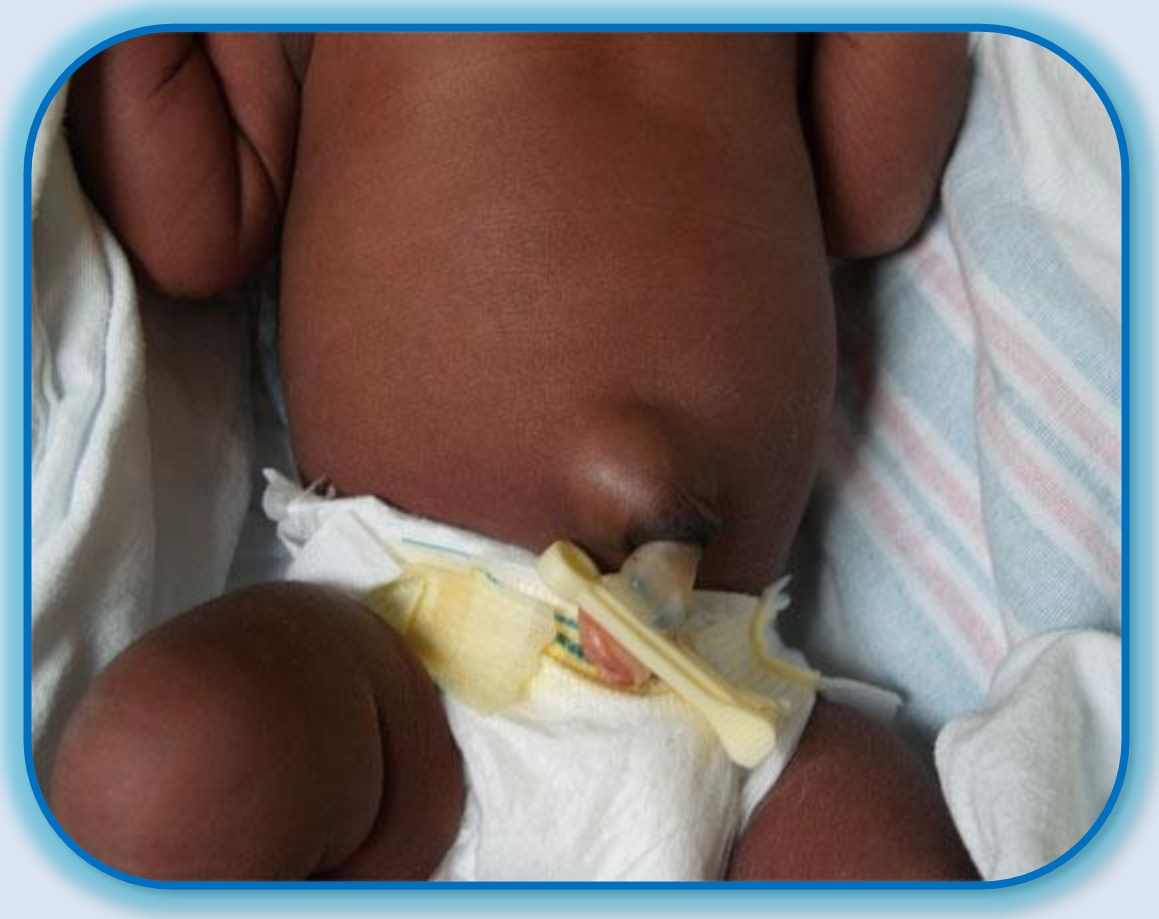
Normal Umbilical Cord



Just minutes after the cord falls off, **A spot of blood or a slight amount of moist, yellow material may be present on the diaper or clothing after cord separation**.

Any bleeding or discharge that **persists** should be evaluated, as this is **not** a normal finding.

Umbilical hernia

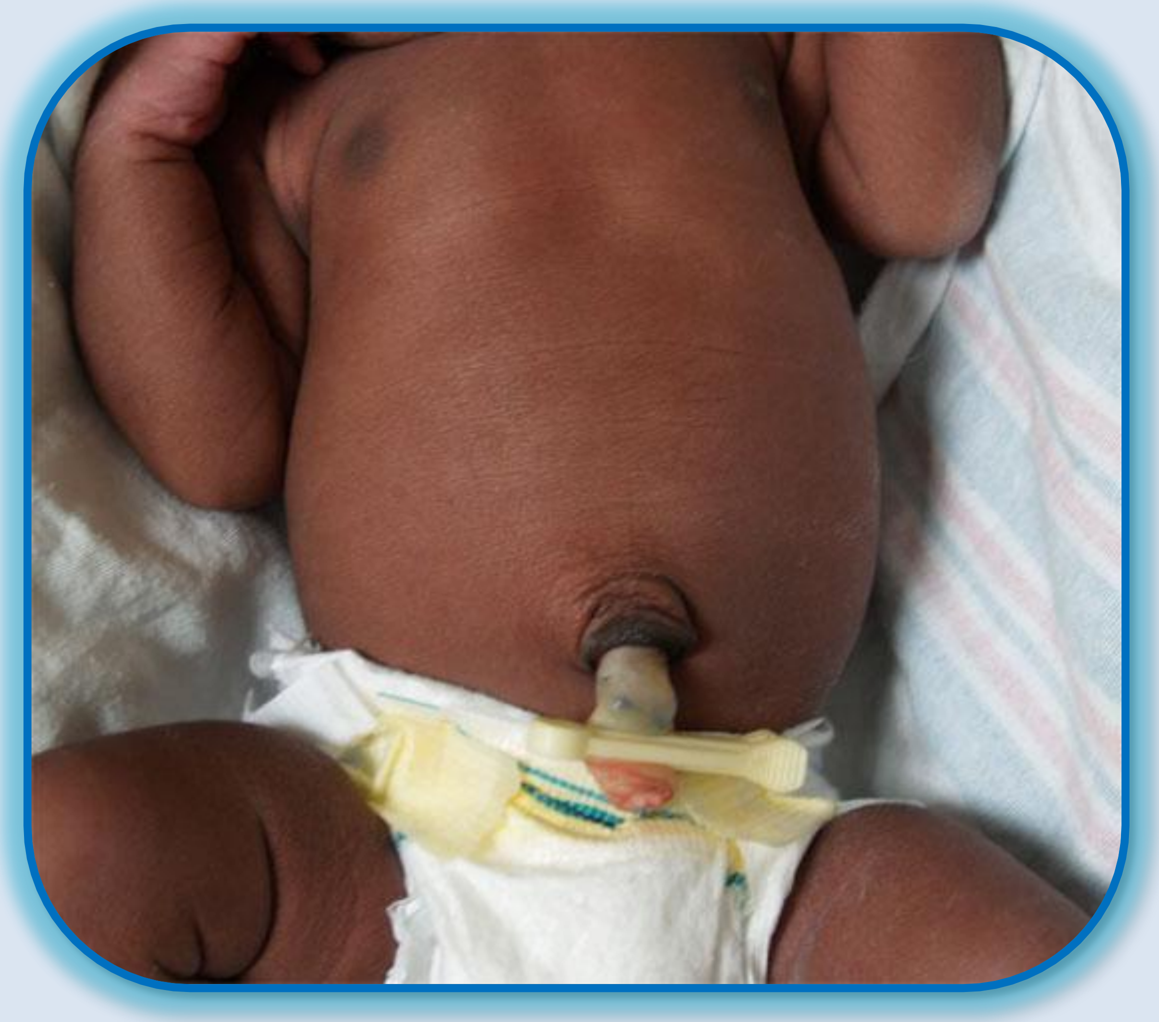


When the umbilical ring is weak or large, an umbilical hernia can result (with increased abdominal pressure).

This does not require treatment, as **most hernias of this type resolve spontaneously** during the first year of life.

Complications, such as strangulation of bowel, are **extremely rare**. Surgical correction is only considered for those who have large defects that are still open after one year of age.

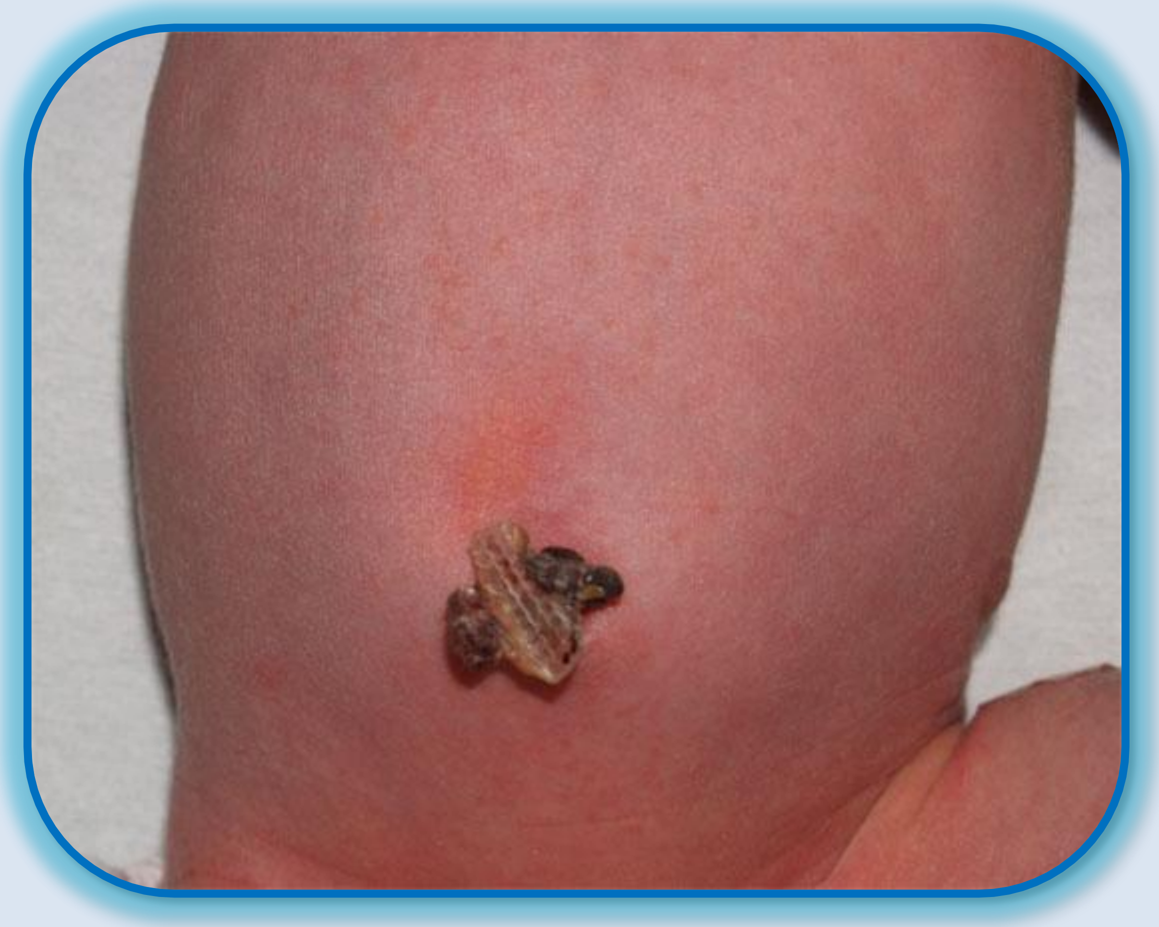
Umbilical hernia



The infant is now quiet, and intra-abdominal pressure low, so the hernia is no longer visible (with slight digital pressure).

Parents are often concerned about the degree of elevation of the bulge, but the **severity of the hernia is determined solely by the size of the umbilical ring**. The visibility of the bulge is related to intra-abdominal pressure and is therefore constantly changing.

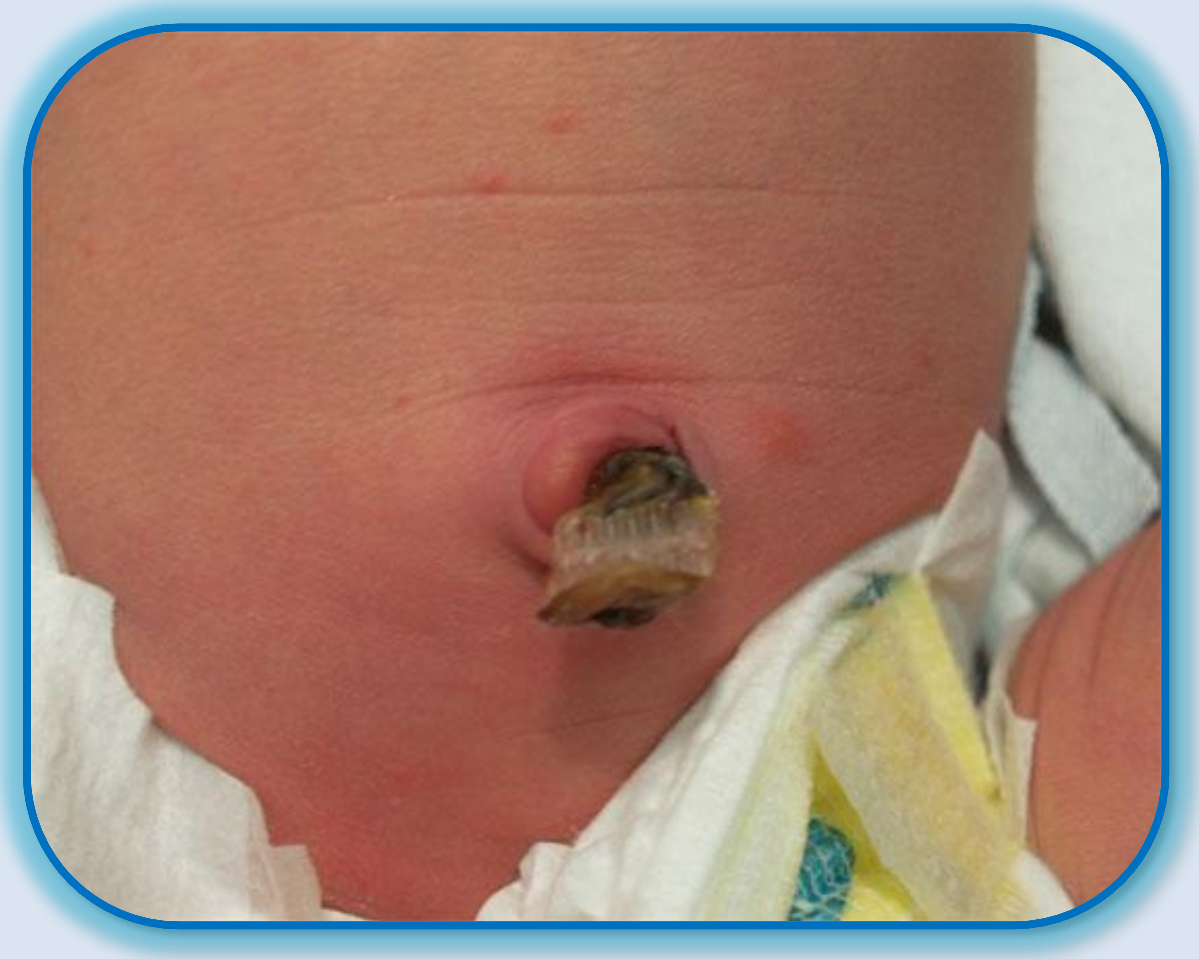
Irritation from the hard, dry umbilical stump



The **redness** superior to the umbilical cord is simply **irritation** from the hard, dry umbilical stump rubbing against the abdomen.

Because omphalitis (an infection of the cord itself) is a dangerous condition, redness in this area should be carefully evaluated. However, the **localized** nature of the redness here, along with the fact that it is somewhat **away from** the actual insertion of the cord and appears very **superficial** is reassuring that infection is not the underlying etiology.

Erythema around the drying cord

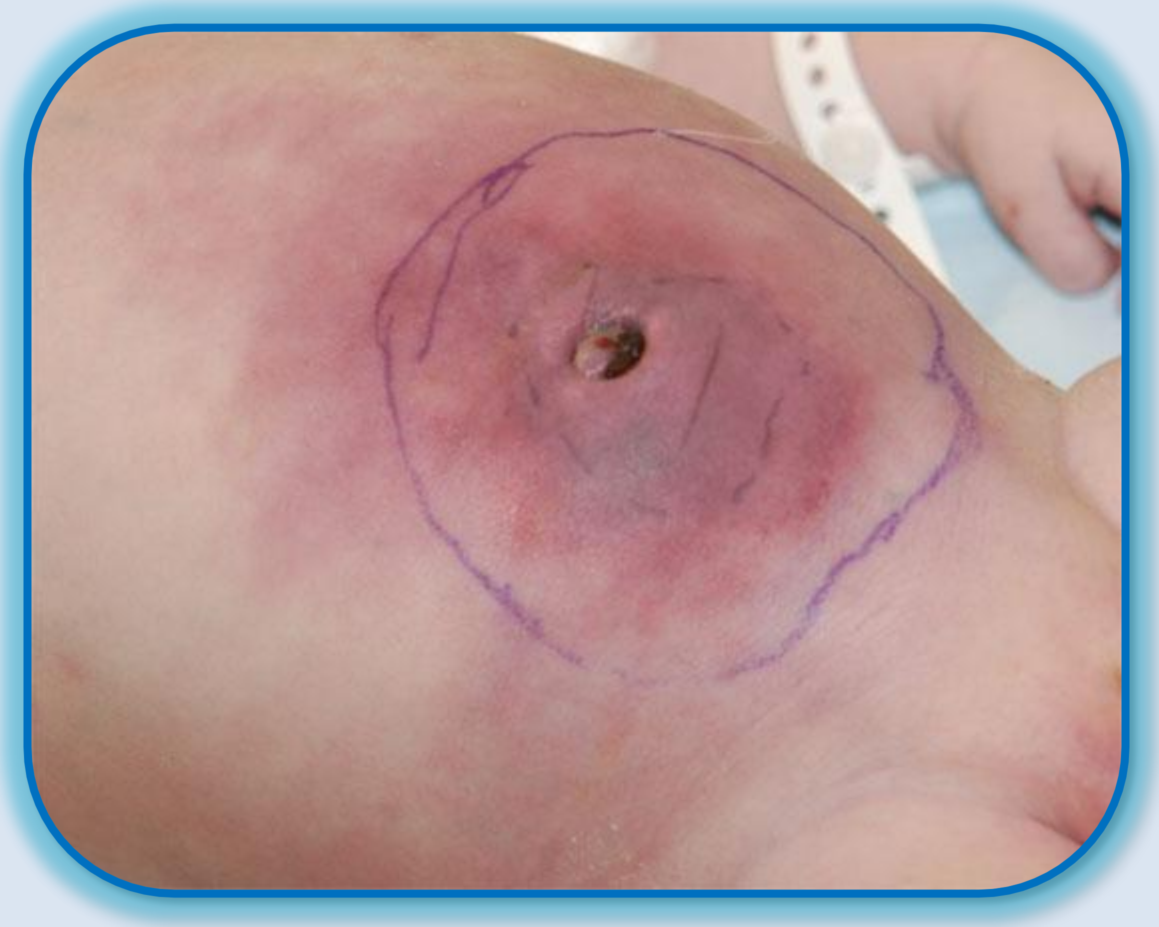


When **"dry cord care"** is the standard practice (no application of alcohol or triple dye), there are a number of infants who have a small rim of erythema around the drying cord.

Although this should be monitored to be sure progression does not occur to omphalitis, this minimal redness is thought to be related to the **normal WBC infiltration** that occurs naturally in the process of cord separation.

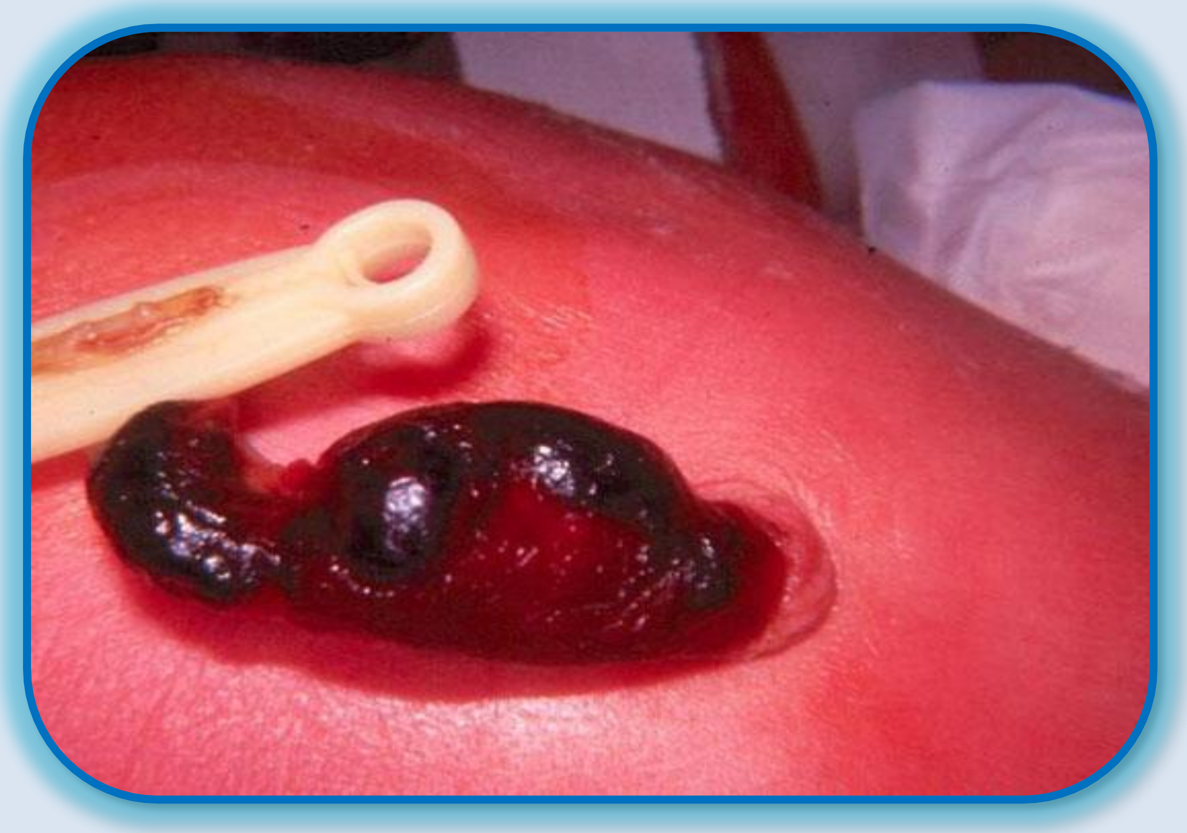
These otherwise well infants do not need evaluation.

Omphalitis



For comparison, this is the appearance of a full-blown case of omphalitis. The **progression of erythema** over time can be clearly seen from the circles marked on the abdomen. The first circle was drawn less than 12 hours after redness was initially seen, and the second circle was drawn several hours after that. Omphalitis of this degree can be fatal, even with aggressive antibiotic therapy, so infection in this area should always be taken seriously.

Umbilical Hematomas

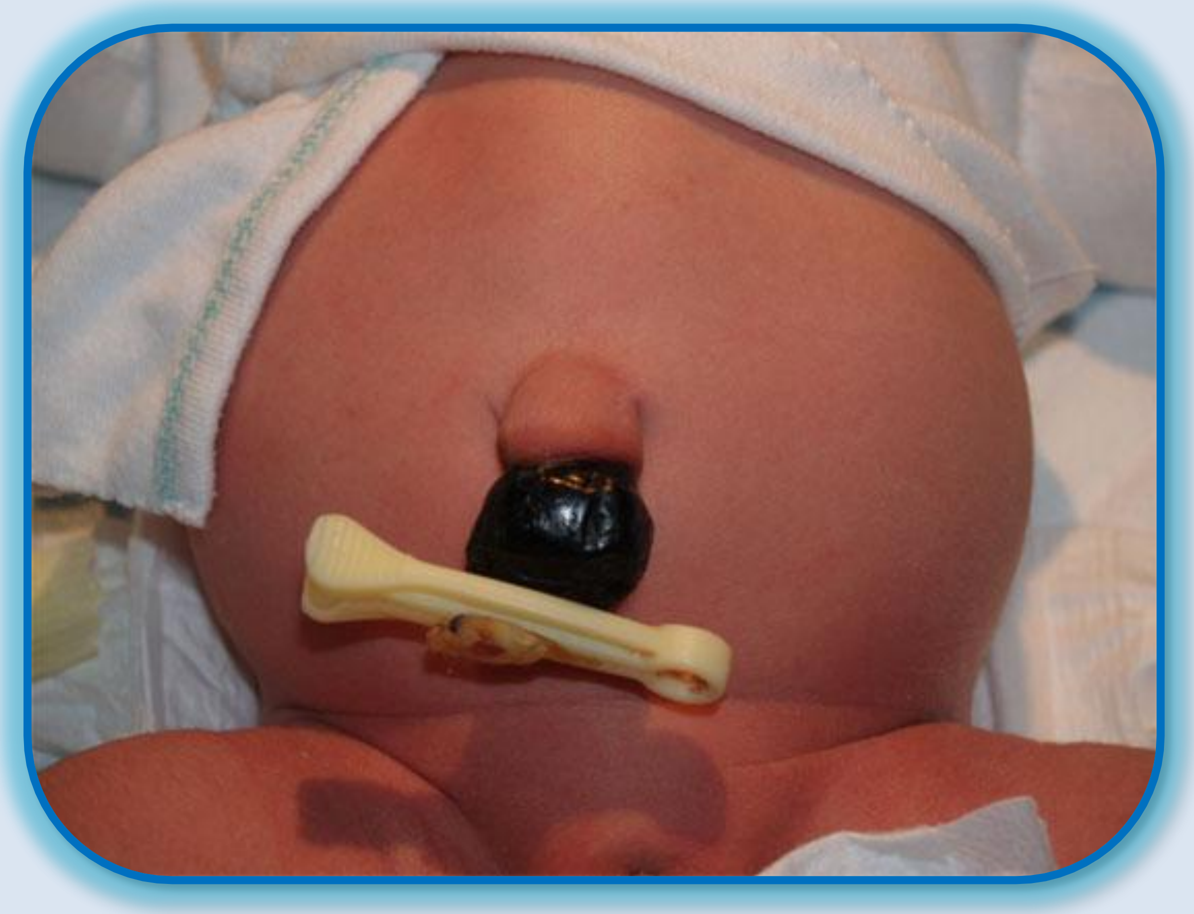


Umbilical hematomas are fortunately very rare (incidence approximately **1:5000**). They may be **spontaneous** or related to **trauma** from prenatal procedures or birth, but they are caused by rupture of the umbilical vessels, usually the umbilical vein.

When the rupture occurs **in utero**, fetal distress is common, and up to 50% of cases result in fetal death.

When noted as a physical finding in an otherwise well newborn, the hematoma is expected to resolve spontaneously and requires no additional evaluation.

Umbilical Hematoma

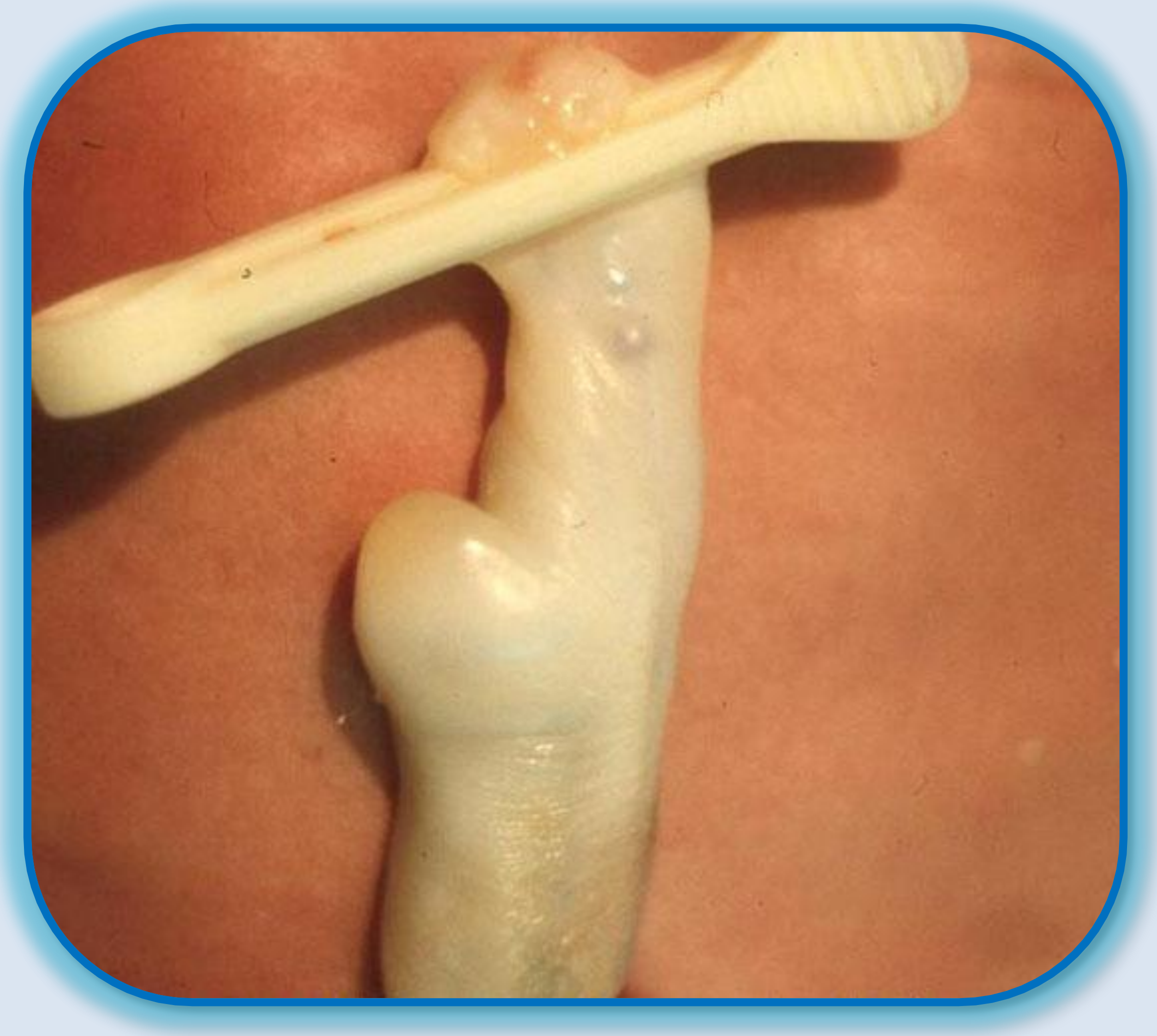


Here is another example of an umbilical hematoma.

Risk factors for this condition include short cord, vilamentous insertion, cord prolapse or torsion, traction on the cord, chorio-amnionitis, or post-dates delivery leading to thinning of the cord components with secondary aneurysm formation.

In this case, the infant had no distress either before or after birth, so no further evaluation was needed.

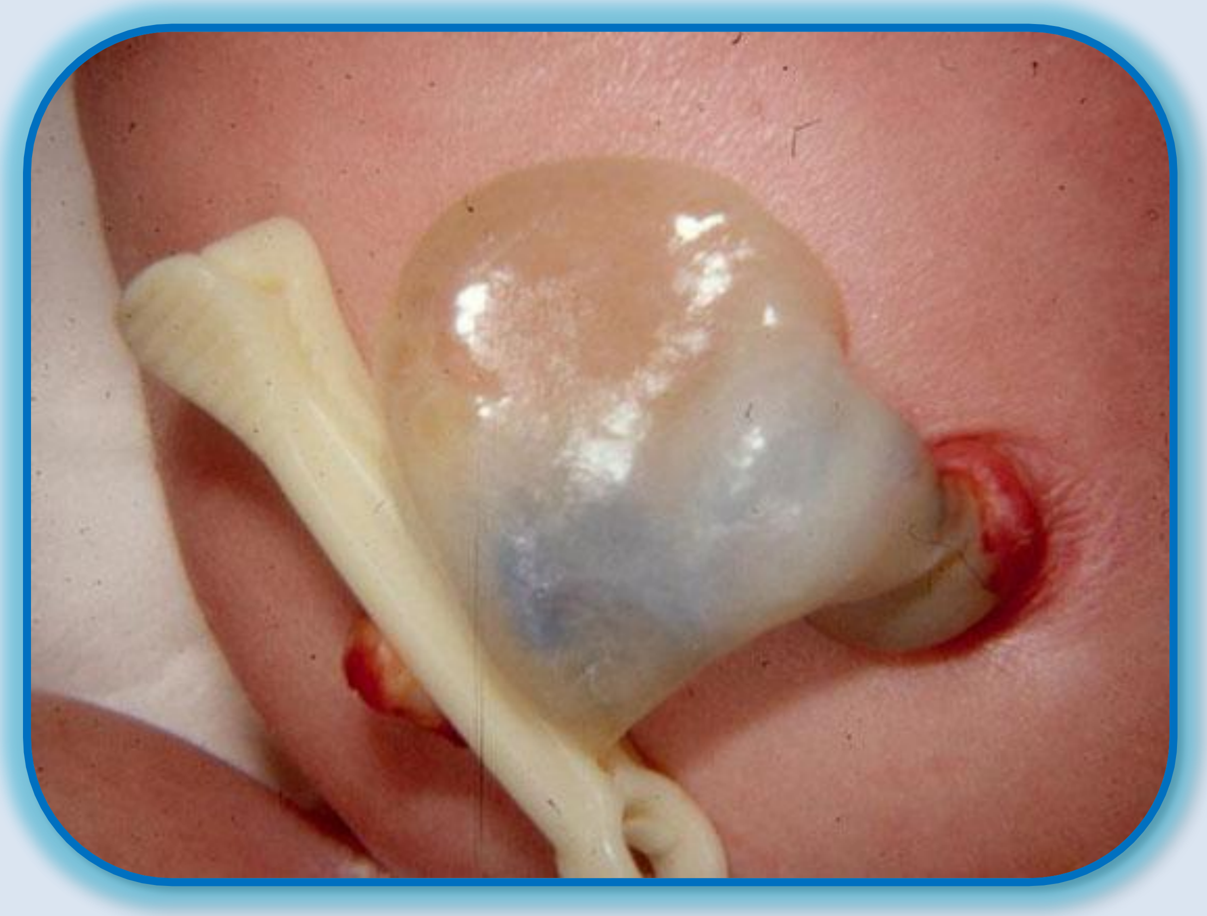
Umbilical Cord Hemangioma



A **very rare** anomaly of the cord.

Large hemangiomas can completely obstruct flow in the cord in utero or lead to high output cardiac failure. Fetal deaths have been reported.

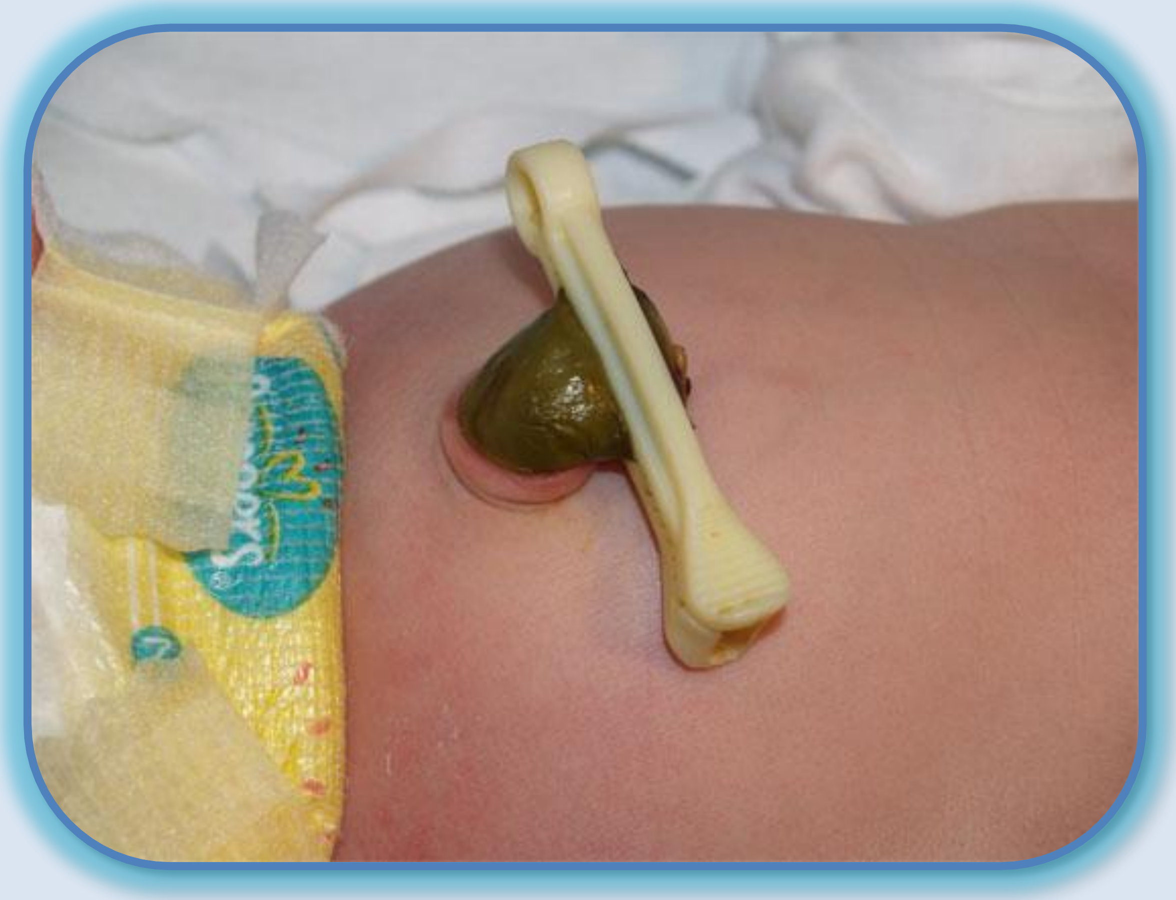
Wharton's Jelly Cyst



Also known as a **"false cyst"** of the cord, It is an area where liquefaction of the jelly has occured.

Up to **20%** of infants with this condition have **associated anomalies**.

Meconium Stained Umbilical Cord

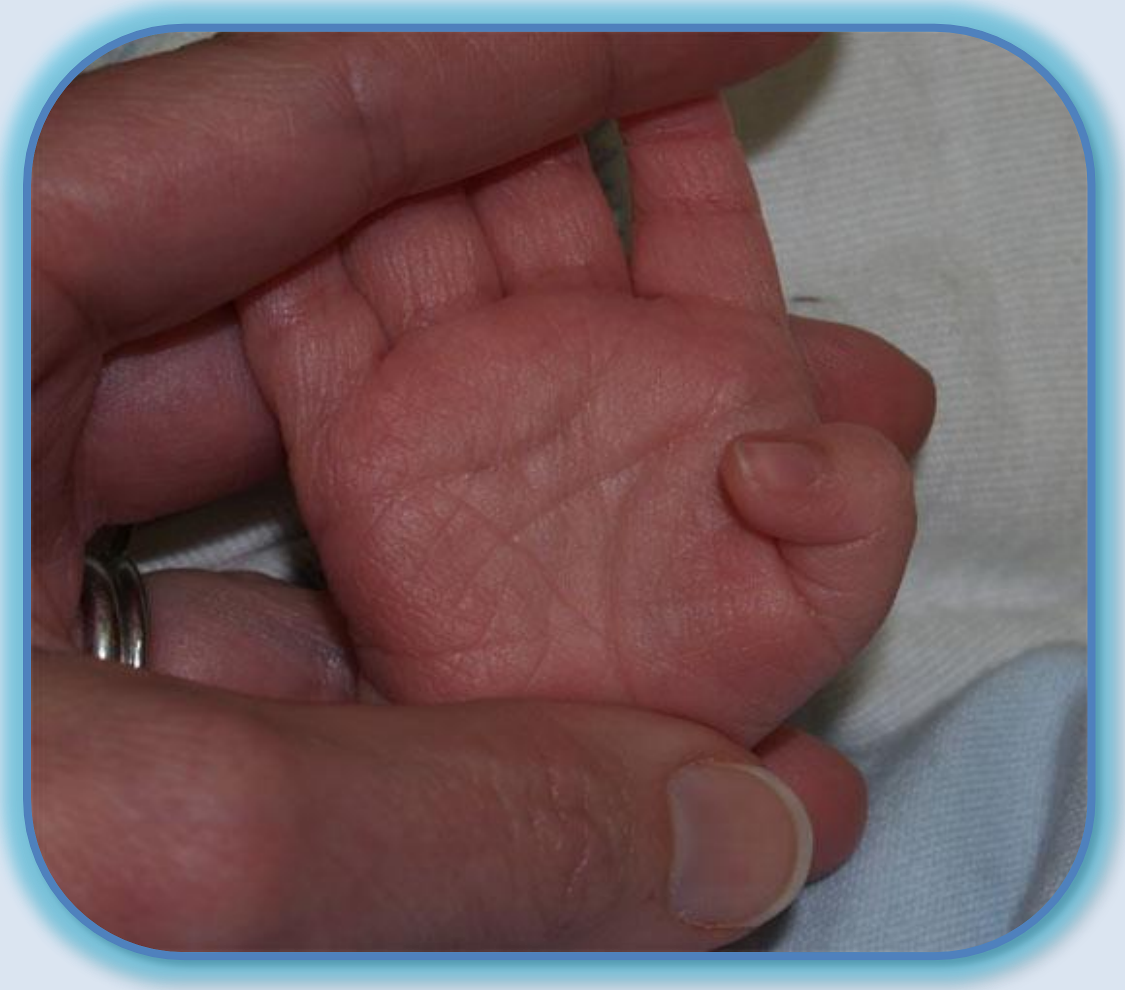


This cord is about 7 hours old, but the normal light yellow color is not visible. This cord was stained by the presence of meconium in utero, which gives it a dark green color.

In addition to the umbilical cord, meconium staining is also frequently seen on the nails.

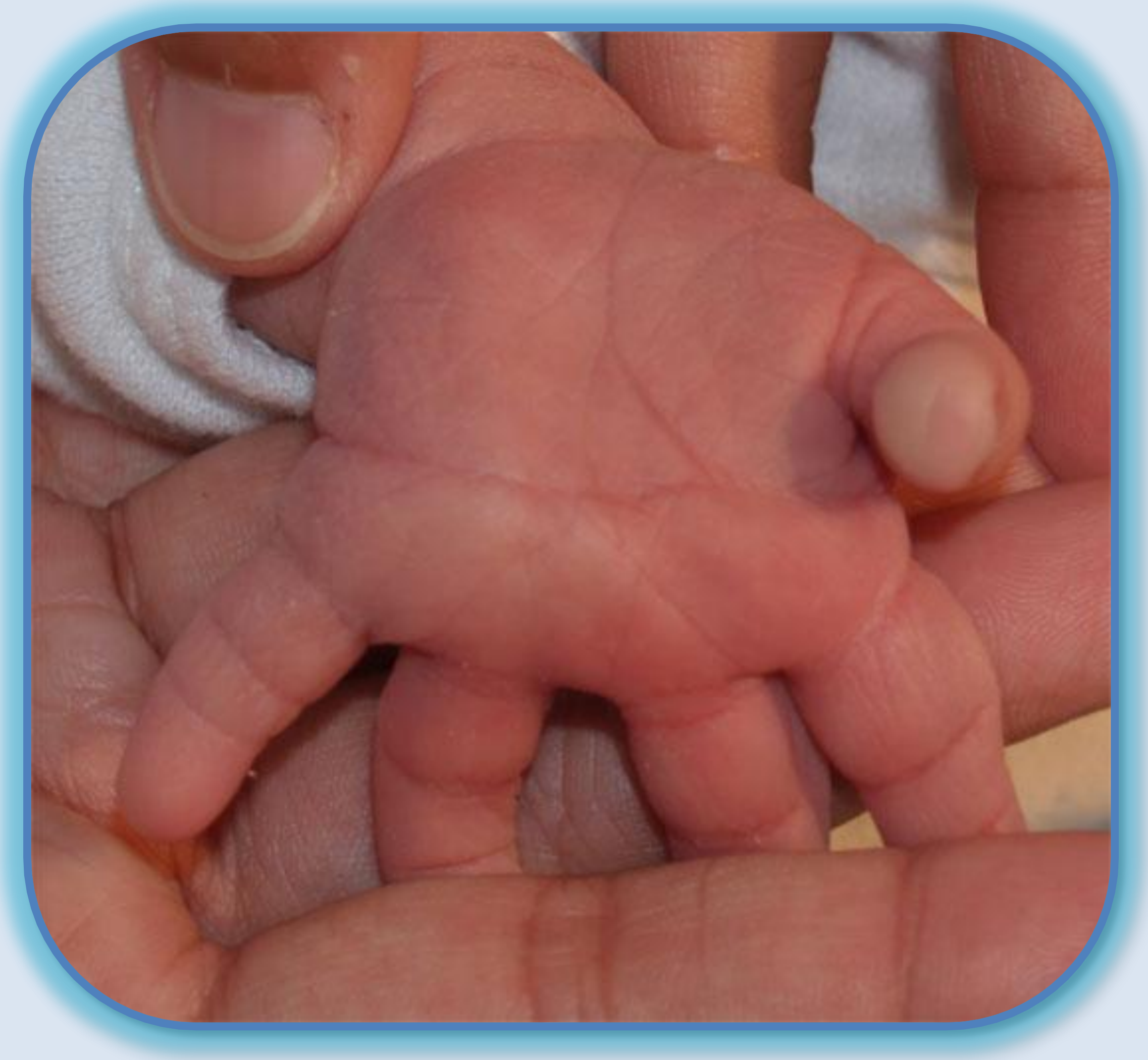
Extremities

Normal Hand Crease



Most newborns have two major creases on the palm, neither of which completely extend from one side of the palm to the other.

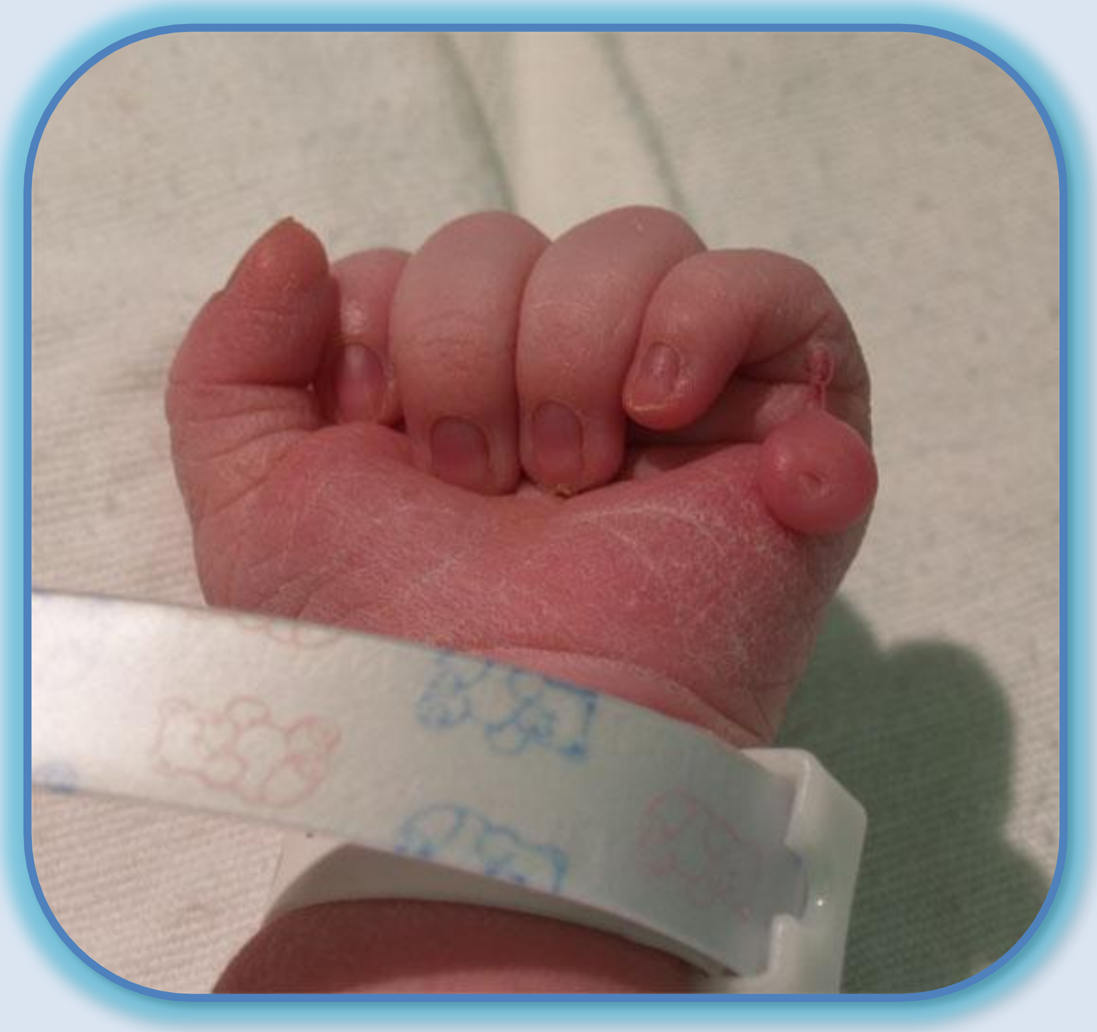
Transverse Palmar Crease



A **common** variant, found in approximately **5%** of newborns, a transverse palmar crease is frequently inherited as a familial trait.

Although single palmar creases are also associated with **Down's syndrome** and other genetic disorders, the absence of other abnormalities on physical exam should reassure the examiner that **no** further evaluation is necessary.

Postaxial Polydactyly

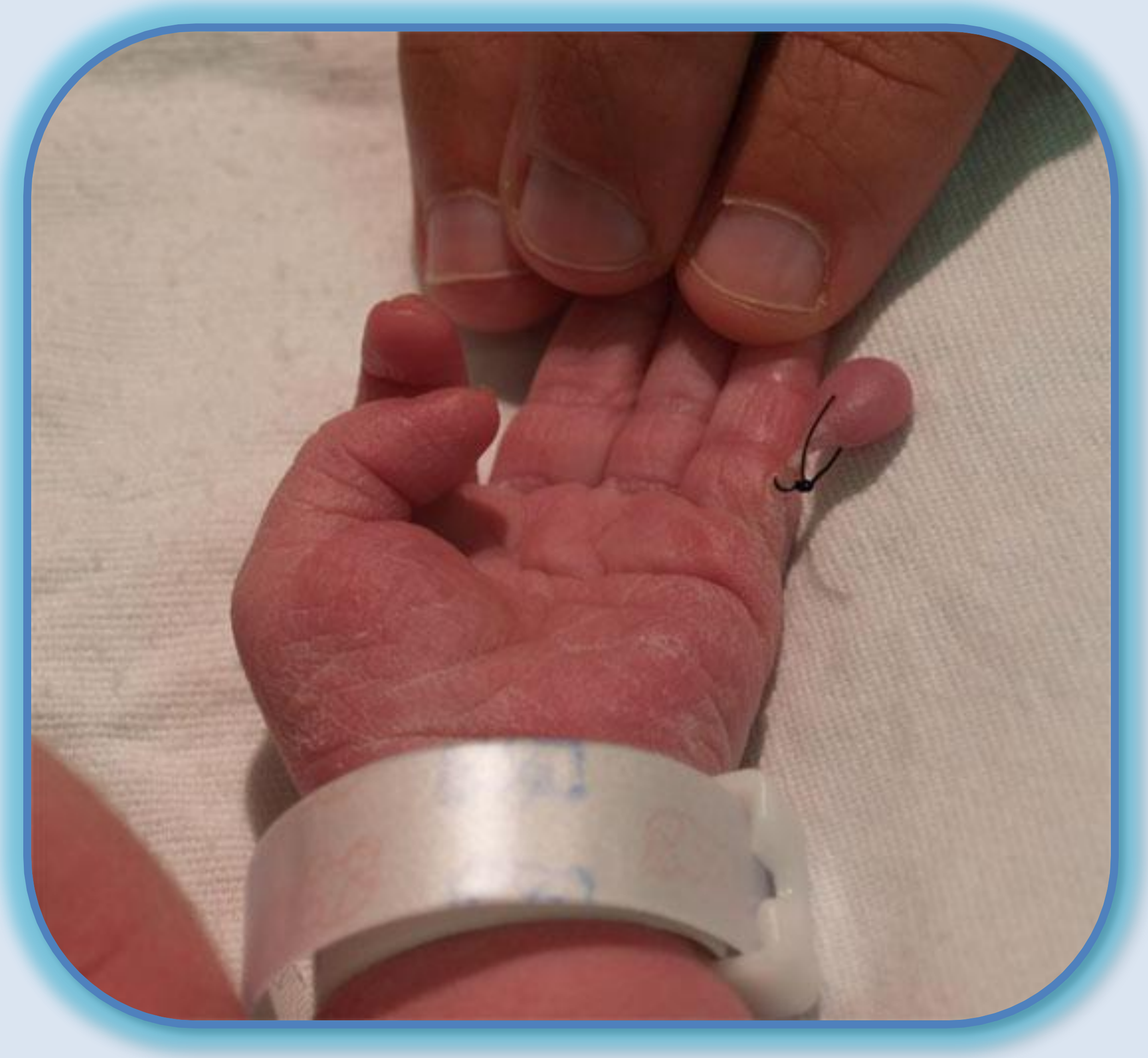


Postaxial polydactyly is the most common variety. The extra digit may seem almost fully formed or may be attached only by a thin fleshy stalk.

This is typically an **isolated** finding.

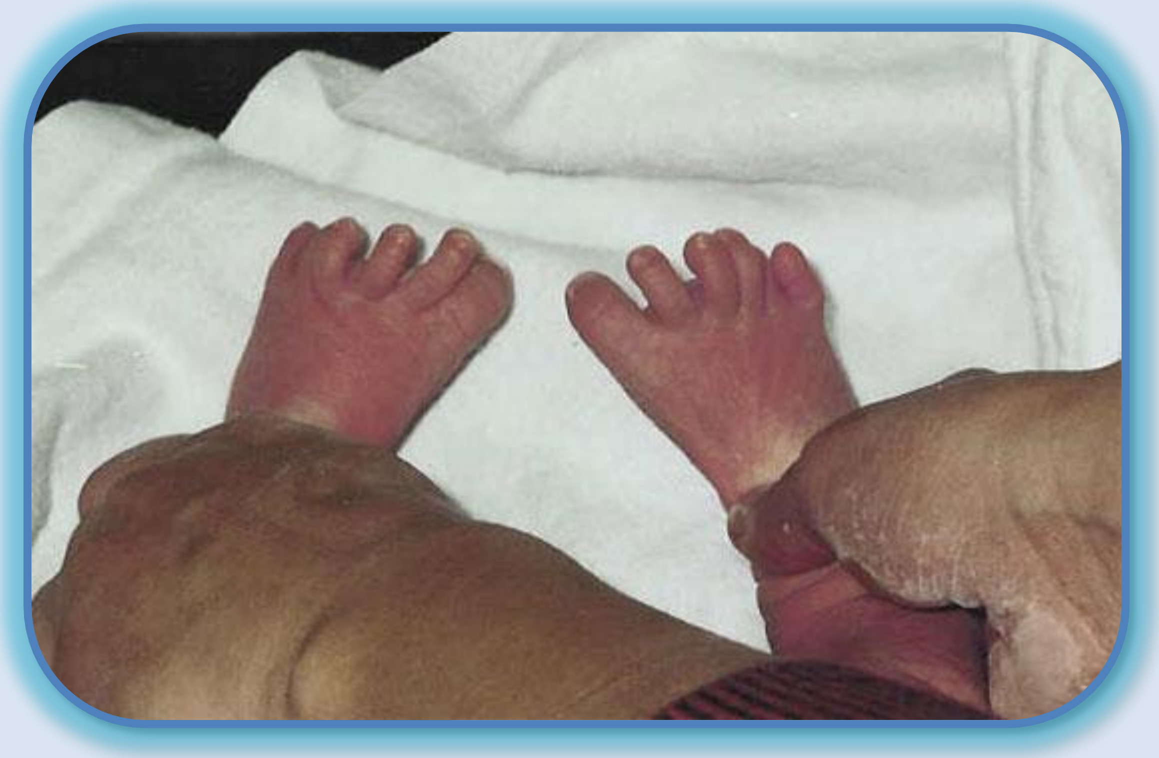
A **positive family history** is often obtained.

Postaxial Polydactyly



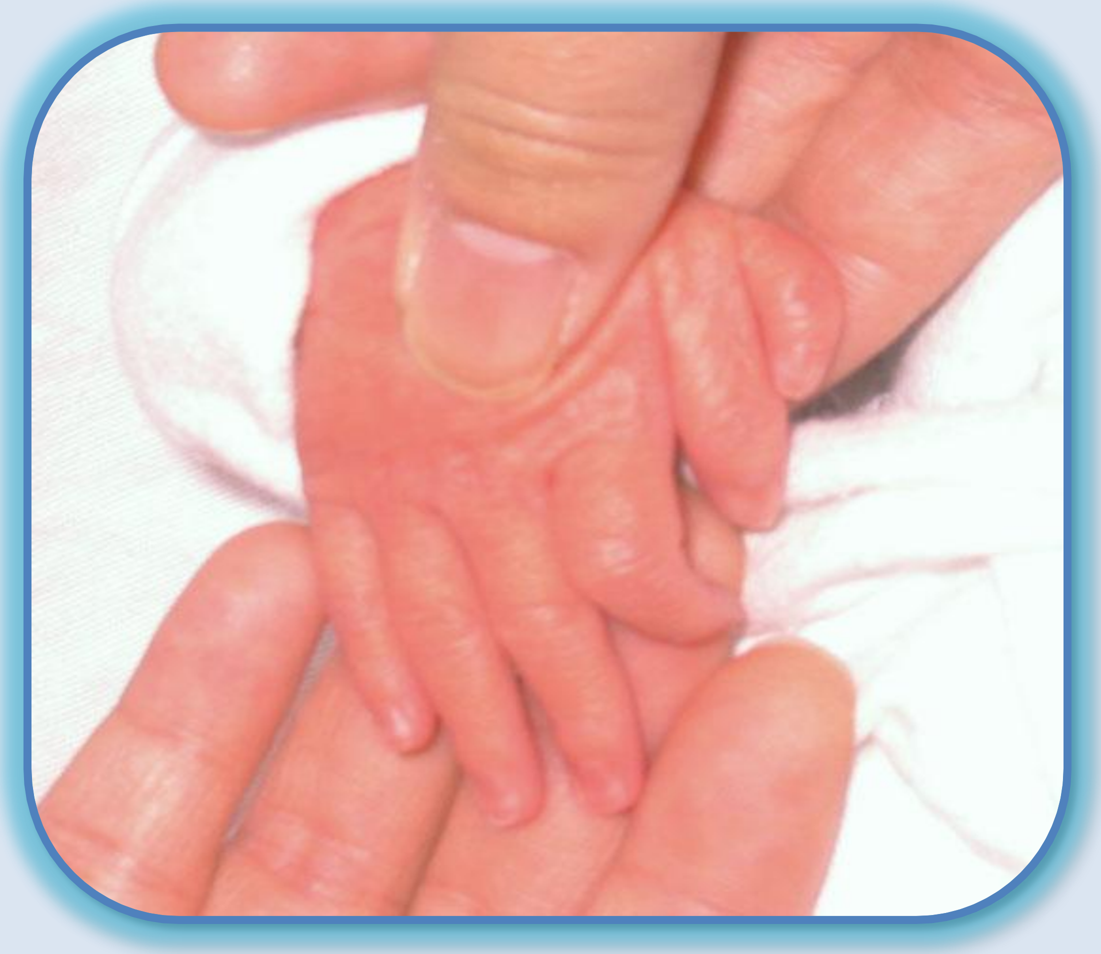
In cases where the attachment of the extra digit is very thin, the appendage can be successfully tied off with a silk suture.

Postaxial Polydactyly



Another example of postaxial polydactyly which is **bilateral** and the extra digits are **fully formed**.

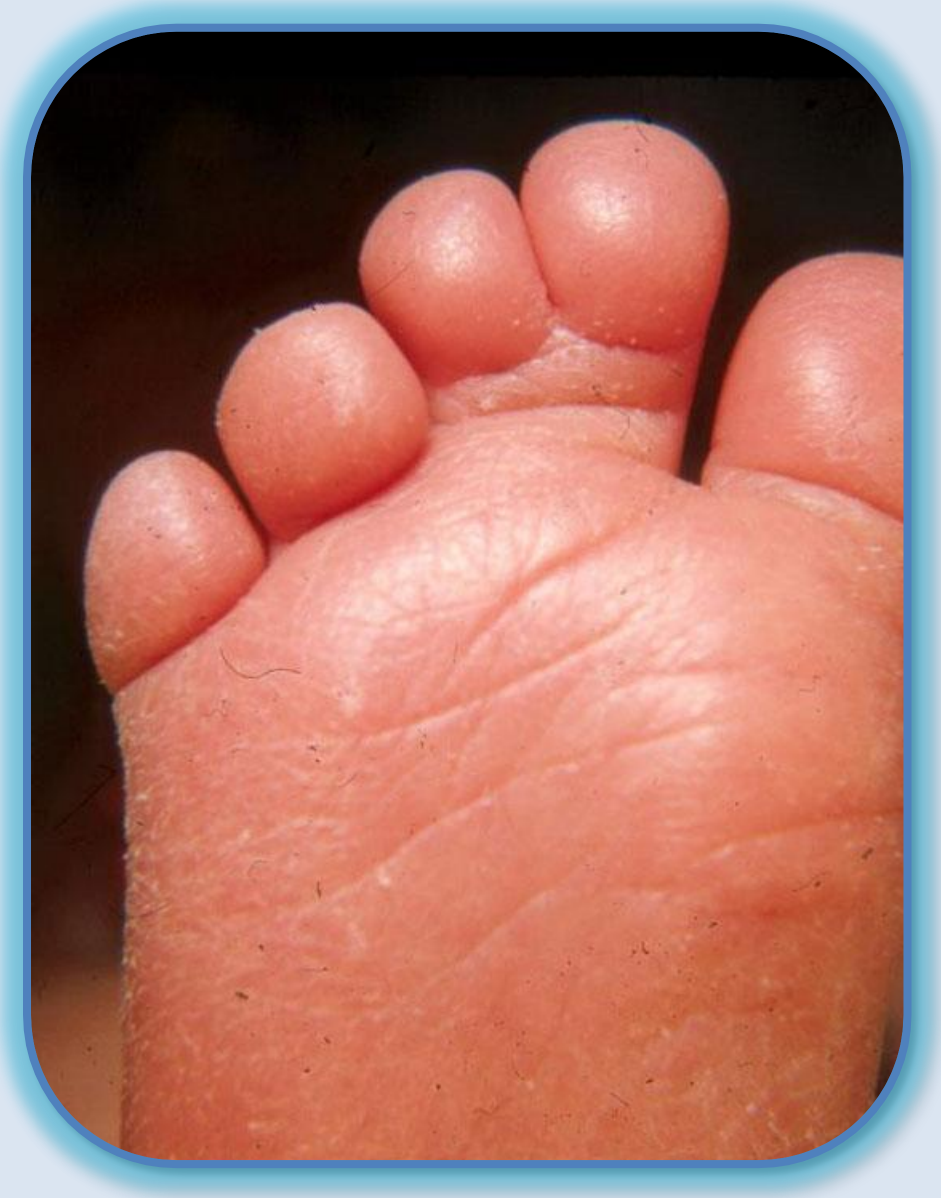
Preaxial Polydactyly



This infant has polydactyly of the thumb as an isolated physical finding. There was no family history and the finding was unilateral. **Preaxial polydactyly is much less common** (and **more likely to be related to an underlying medical condition**) than the postaxial variety.

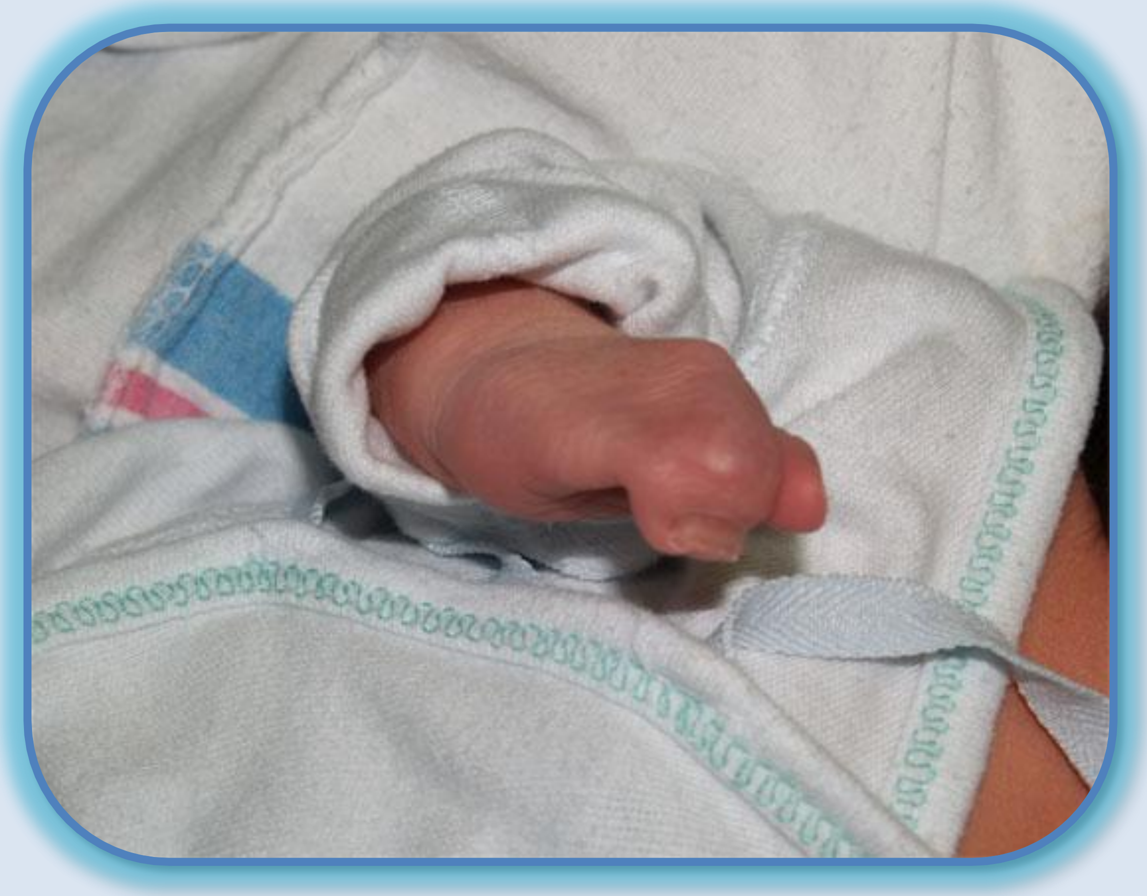
Surgical correction is generally delayed for several months to lessen the risk of general anesthesia.

Syndactyly of the Toes



This type of mild syndactyly is found occasionally on the physical examination. Again, this is a **subtle** finding. If the exam is not a careful one, this can easily be missed since both digits are otherwise normally formed. This is usually an **isolated** finding, and in this location, has no impact on function.

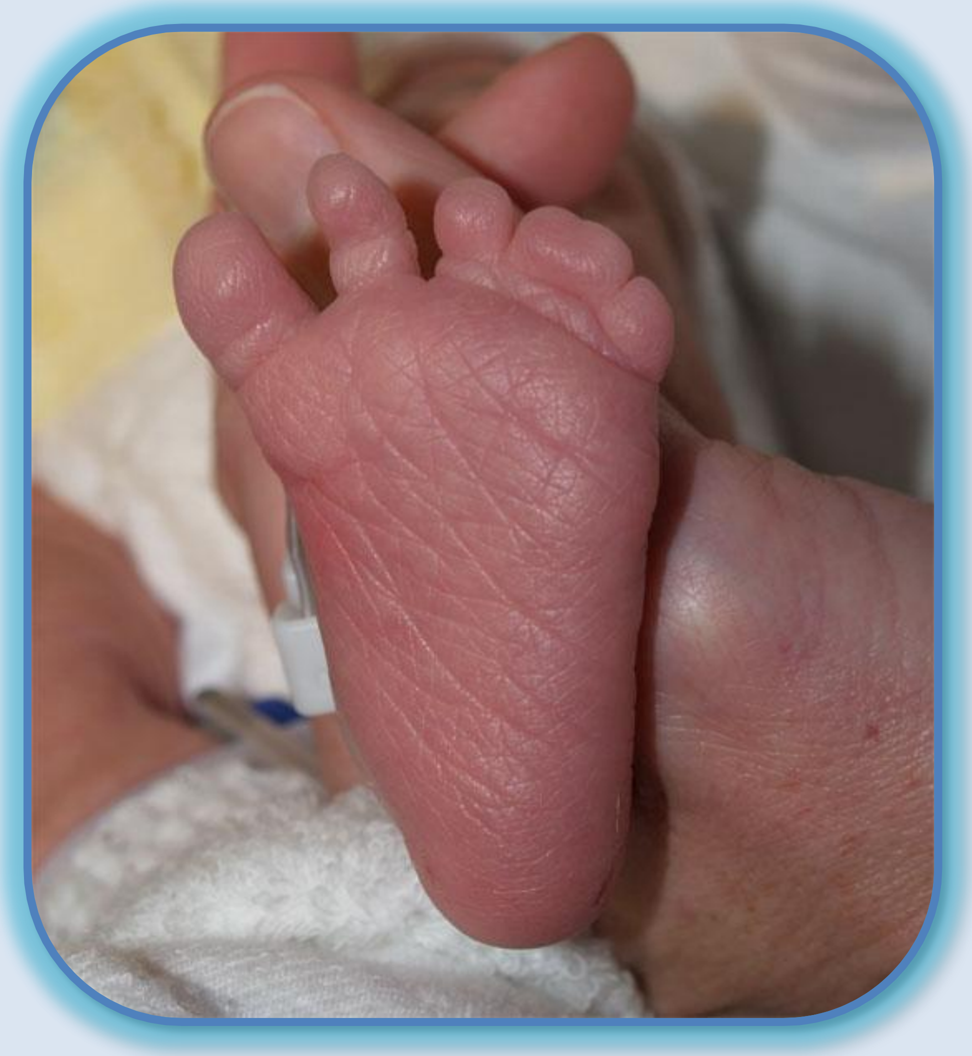
Syndactyly



In this case, the syndactyly is **severe**. All four of the digits on the right were completely fused together (notice the four fused nail beds). The thumb was normally formed and can be seen to the right of the abnormal area.

This was a unilateral, isolated finding in an otherwise well newborn; amniotic bands were thought to have caused this problem.

Polysyndactyly

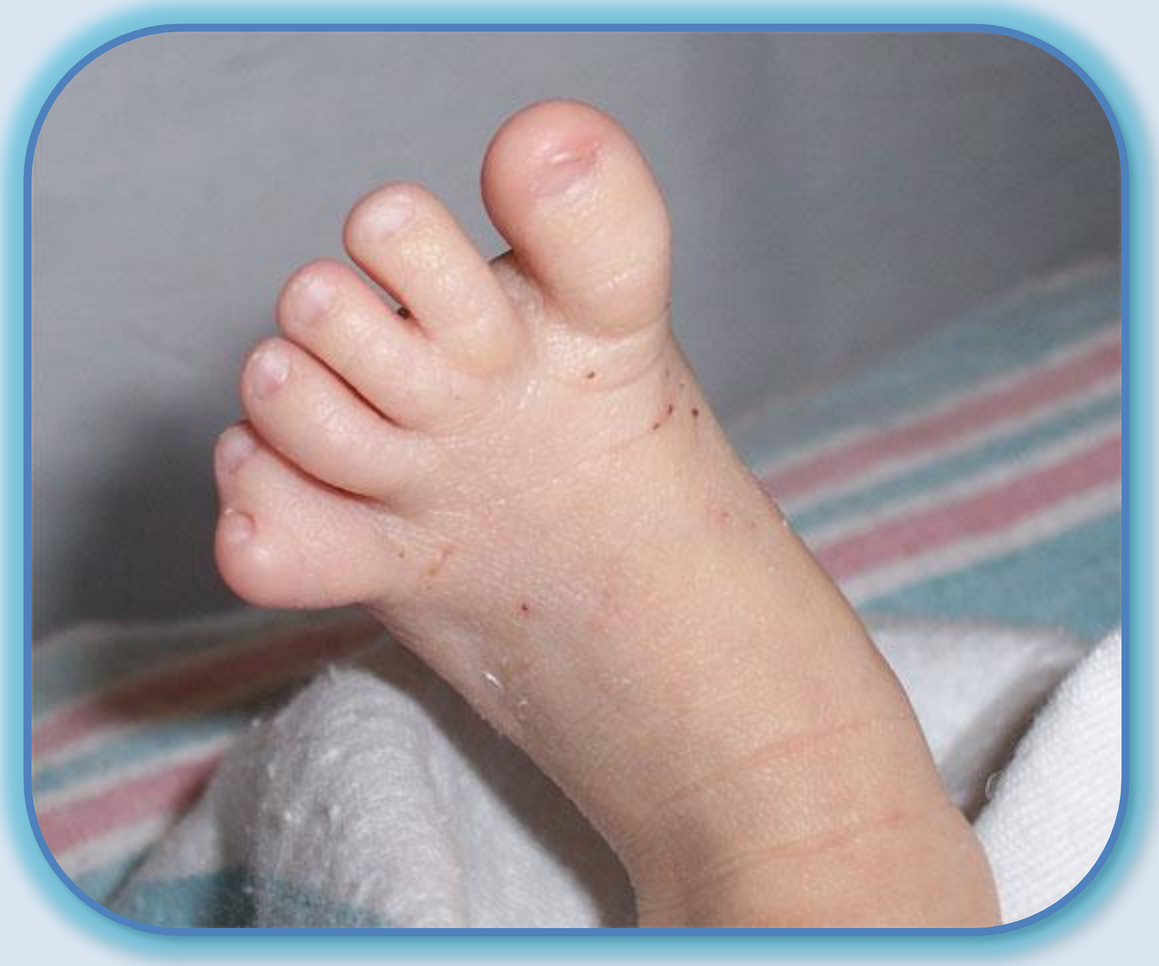


When the digits are fused in addition to being too numerous, the term polysyndactyly is used.

Careful examination is important to identify conditions such as this. If the socks (or mittens) are not removed, this finding can be easily missed.

While this is not expected to cause a significant functional problem, cosmesis can be of concern as the child gets older.

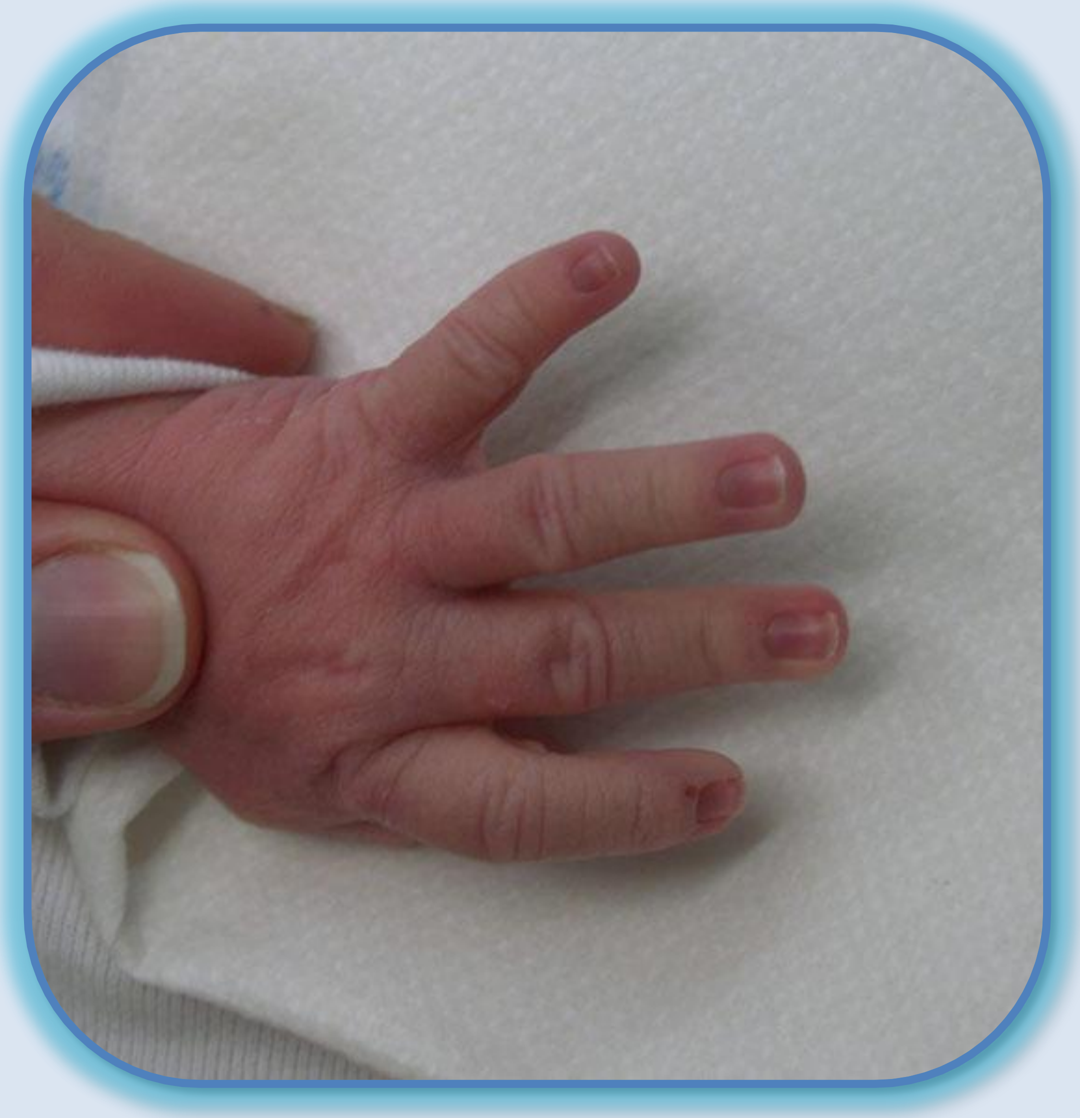
Polysyndactyly



Here again polysyndactyly is present.

In this case, the fifth and sixth digits are completely fused to each other. With careful inspection, a partial syndactyly of the second and third toes is also seen.

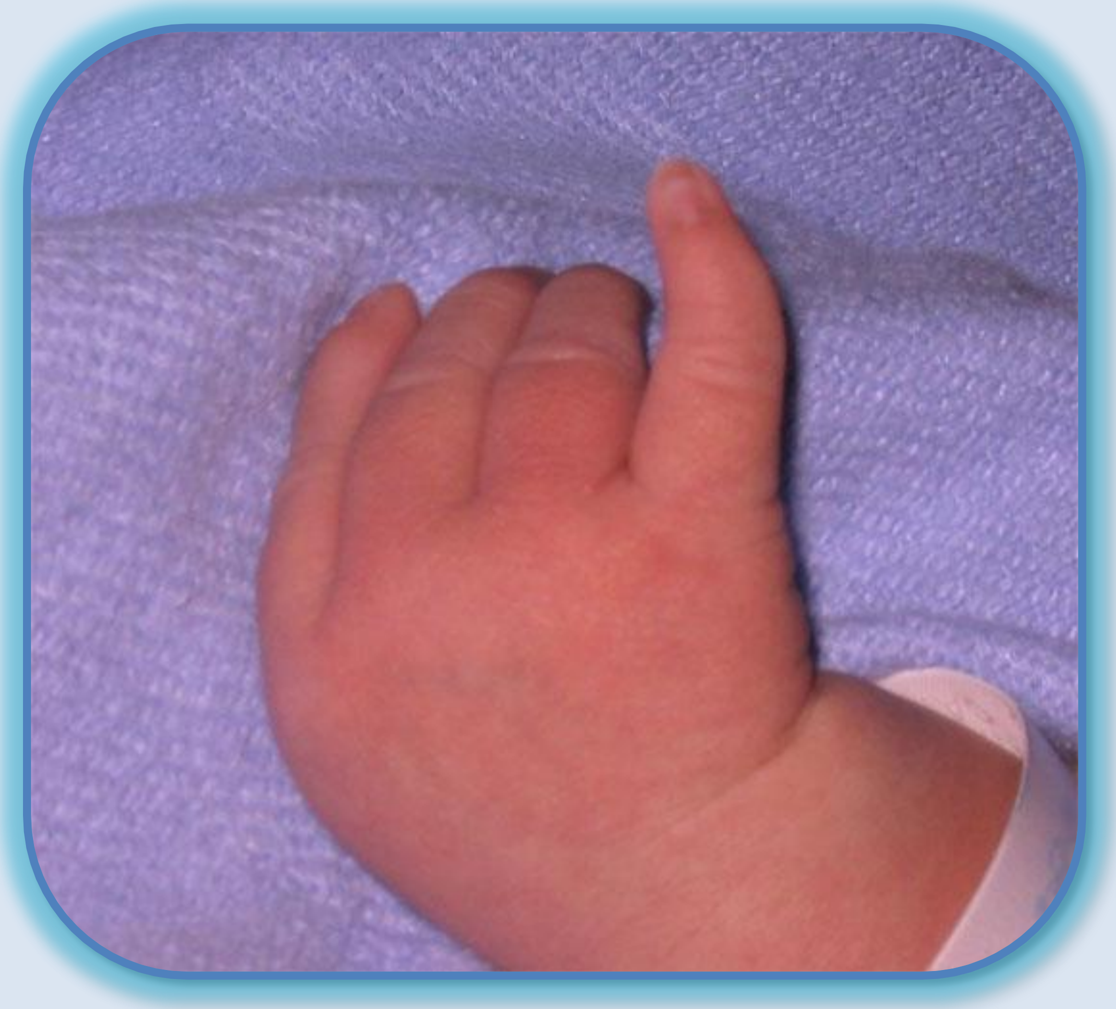
Clinodactyly



A slight medial **incurvation of the fifth finger** is a frequent finding on the newborn exam. It is often inherited as a familial trait.

Although it can be associated with several genetic disorders, including Down's syndrome, the absence of other physical findings will confirm that it is a benign, isolated finding. In this case, no further evaluation is necessary.

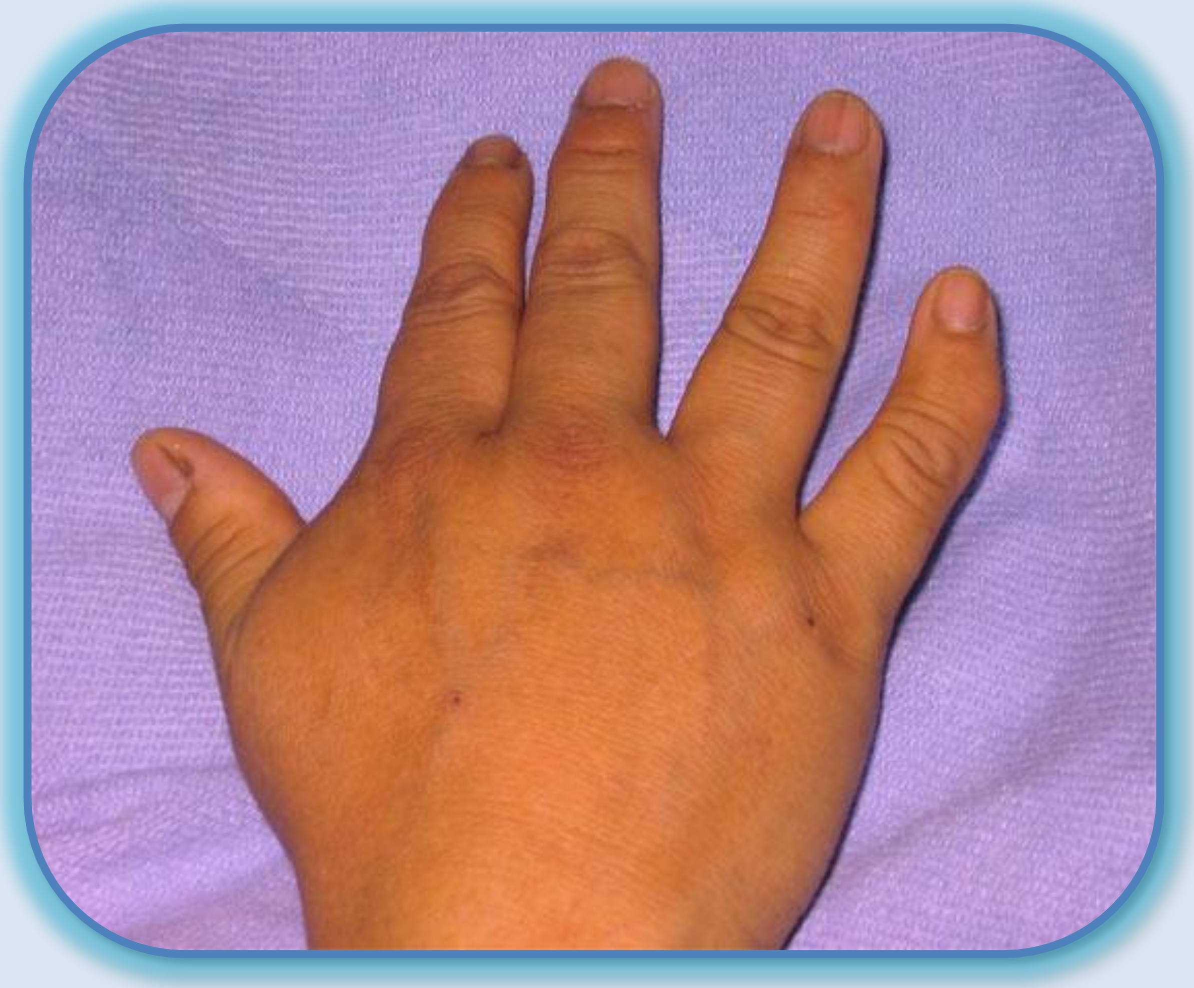
Clinodactyly



This infant has a more pronounced curvature.

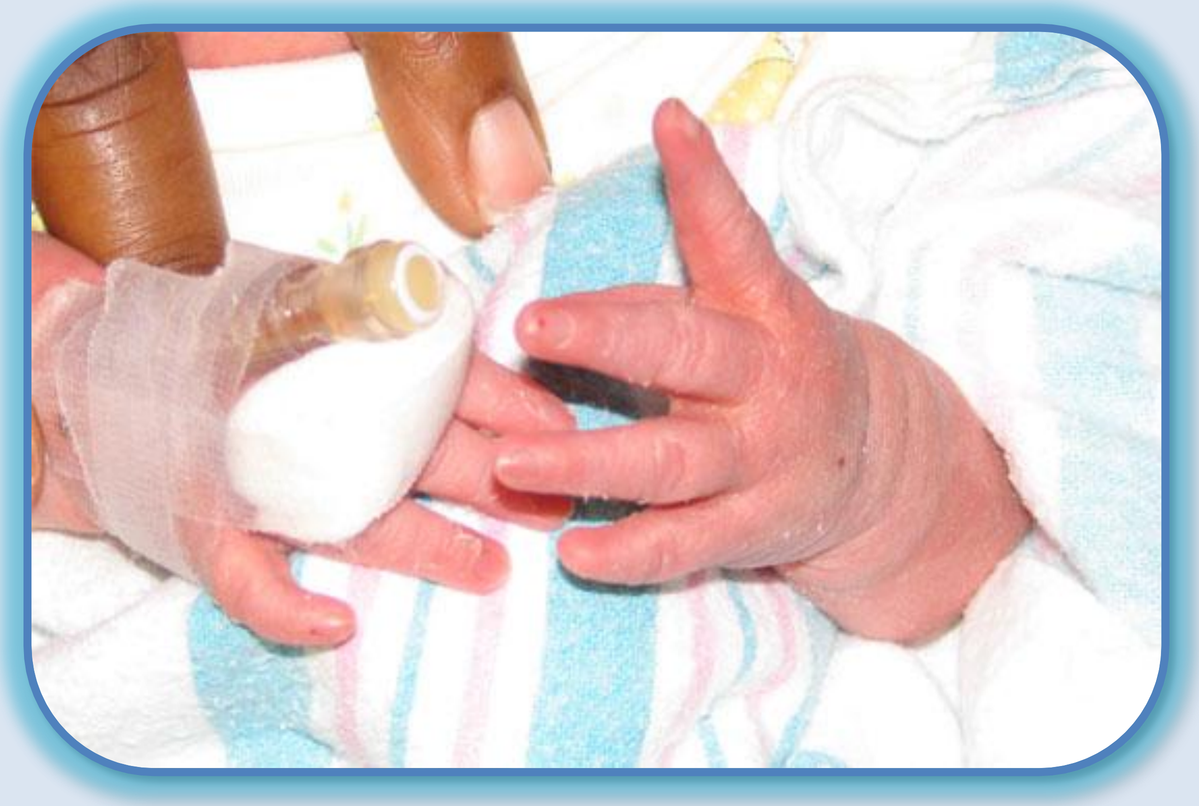
Again, this was an isolated bilateral physical finding. As seen in the next photo, this appearance was not a surprise for the mother, who had this trait as well.

Clinodactyly



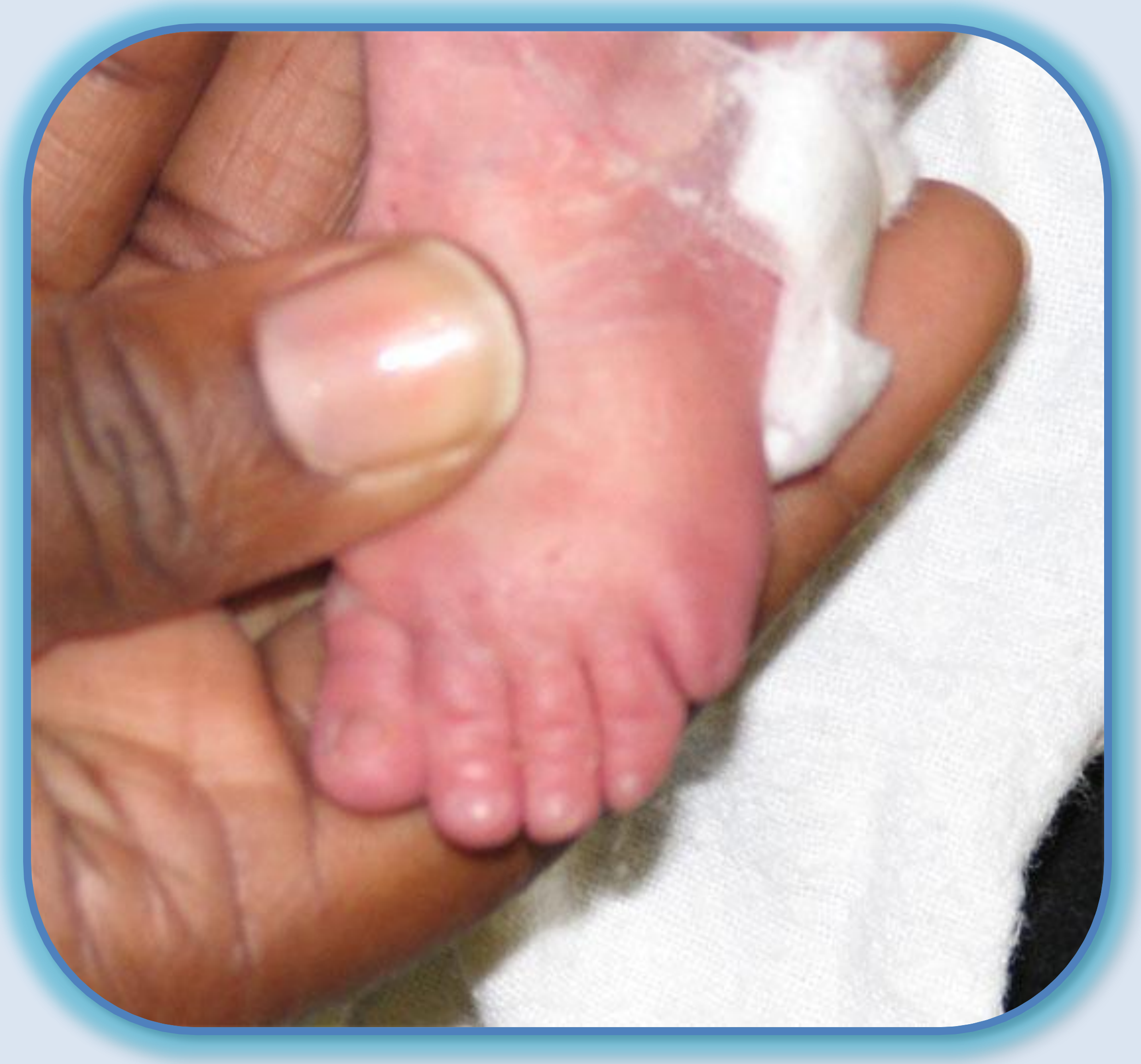
Here is the right hand of the mother of the infant in the previous photo. Both mother and baby were healthy **(this is a benign finding when isolated)**.

Finger Hypoplasia



On first inspection, this infant's hands may appear normal, but on closer inspection, the **fifth fingers bilaterally appear hypoplastic**, and there is a complete absence of the nail on the infant's left side.

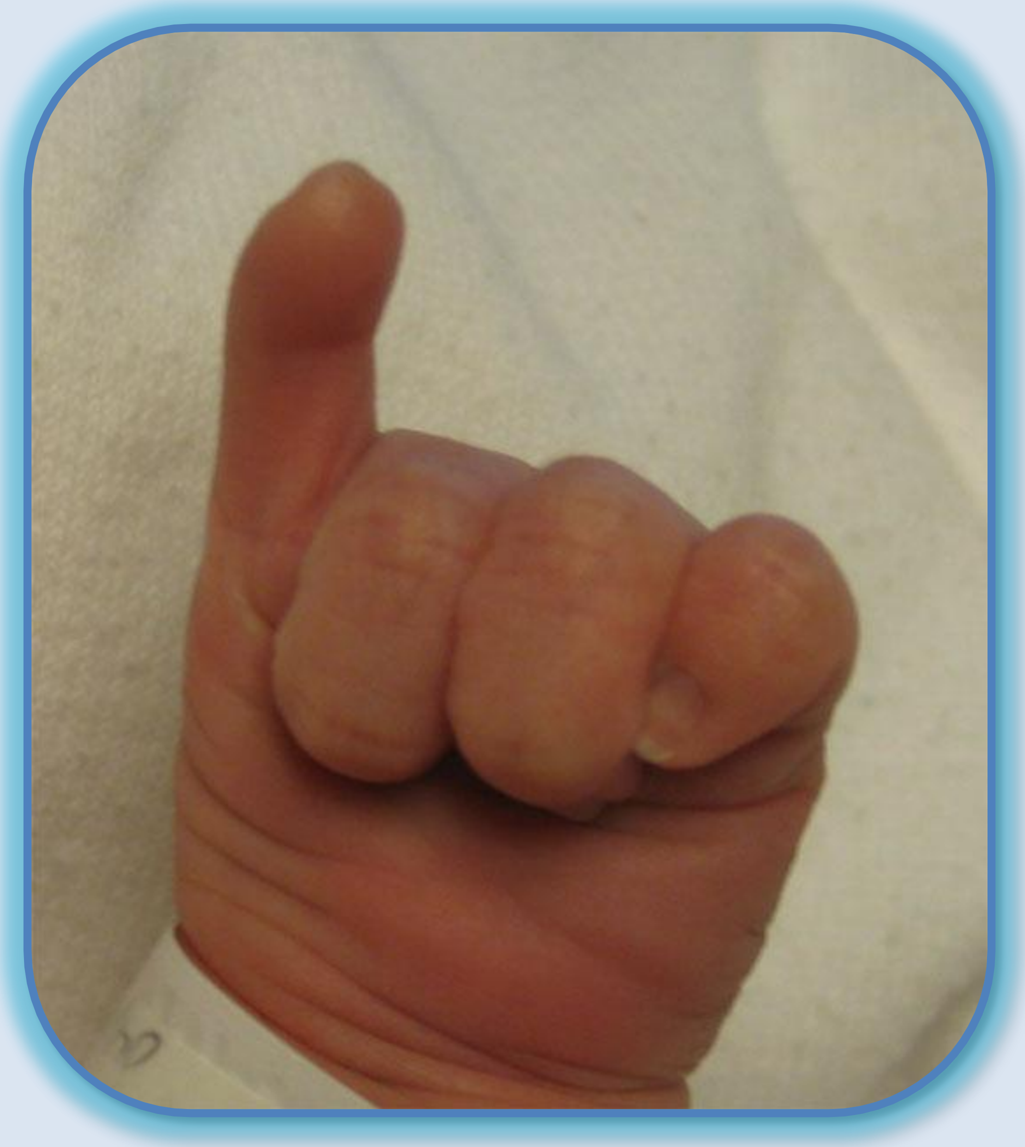
Toe Hypoplasia



This is the same patient as the previous photo.

Here, hypoplasia of the fifth toe (and nail bed) is apparent. This will not create a functional problem, but these findings did lead to an underlying diagnosis of **Coffin-Siris syndrome**.

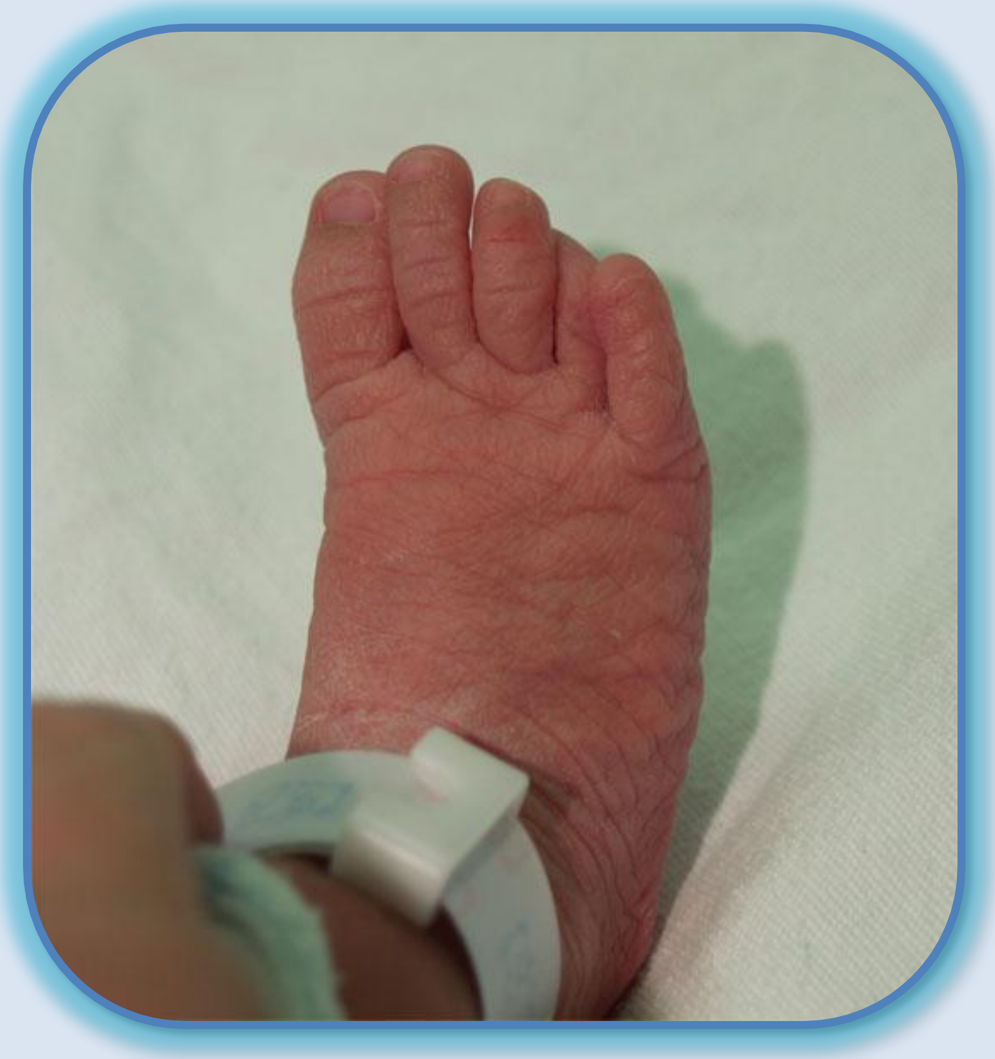
Thumb Aplasia



Whenever digits are missing, underlying genetic or chromosomal diagnoses should be considered.

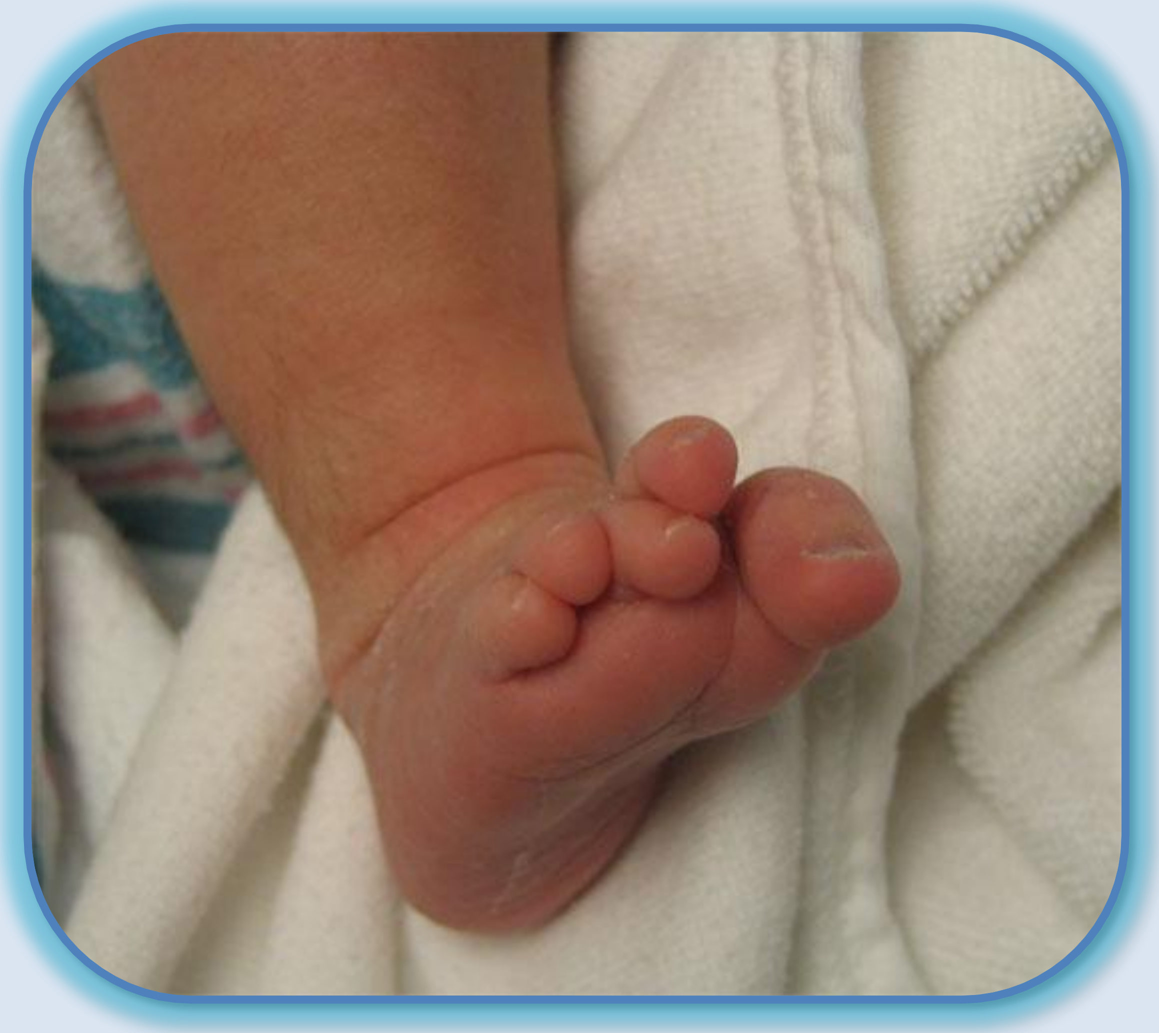
Amniotic bands could also be responsible for absence of a digit, **but** in those children, the physical examination should be otherwise normal.

Overlapping Toes



Some newborns will have toes that seem to overlap one another. At times, this is related to clinodactyly of one of the digits; at times, it is a positional deformity. Either way, it is considered a **minor deformity**. **As an isolated finding, this is of no significance.**

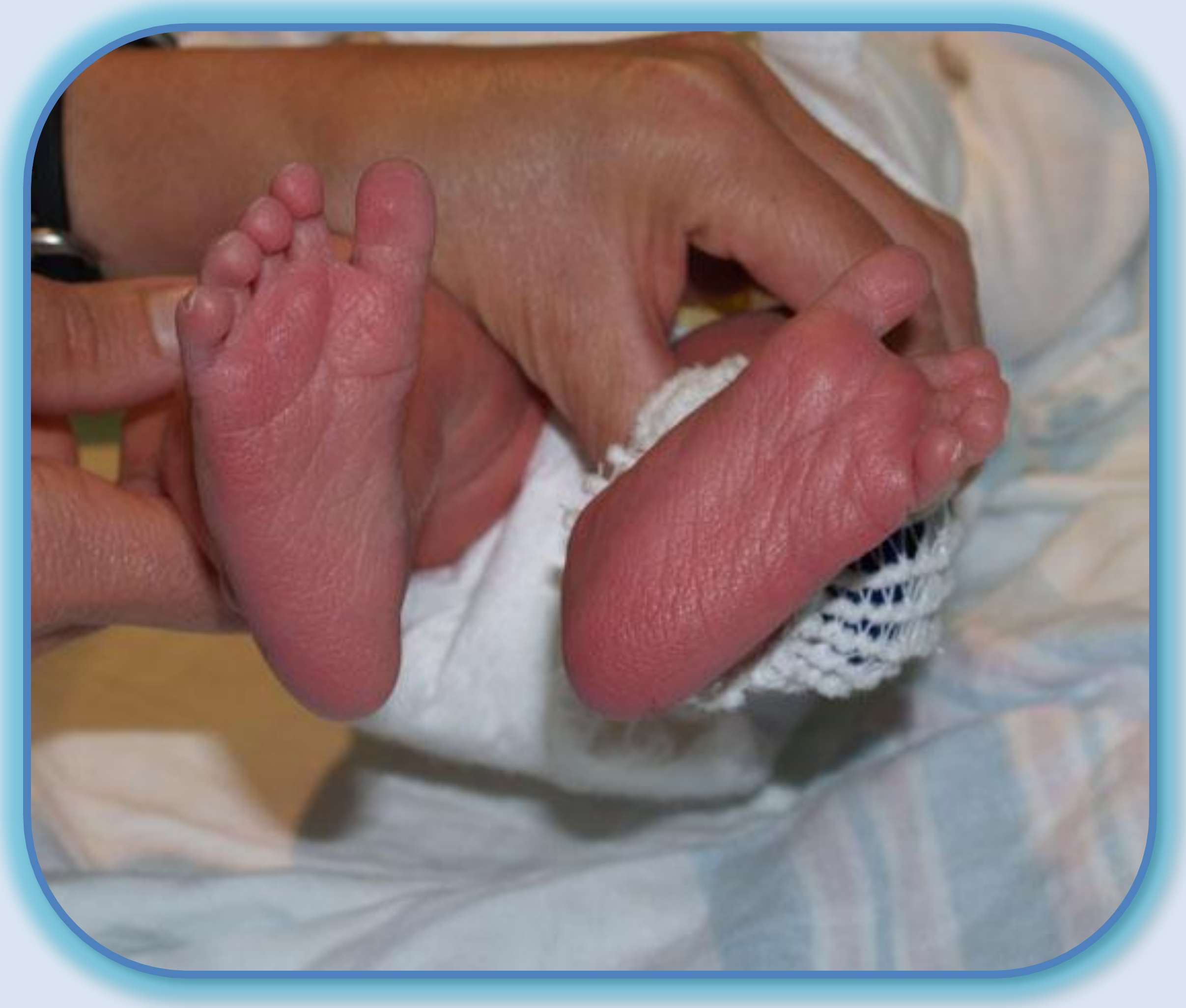
Overlapping Toes



This infant has more marked overlapping of the toes.

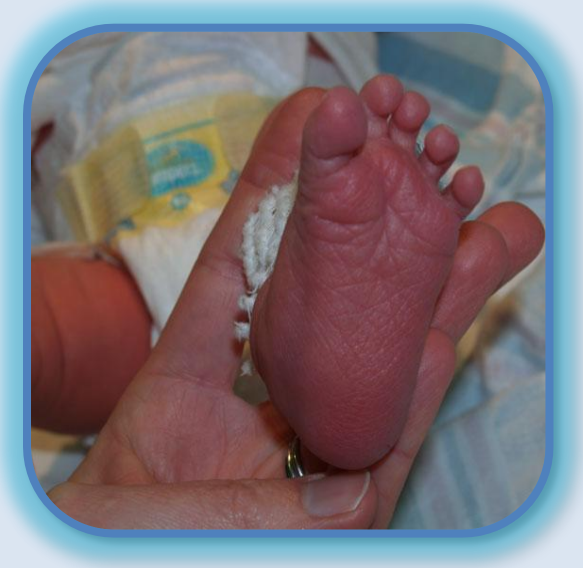
This child did have an underlying genetic diagnosis, but there were other abnormal physical findings present.

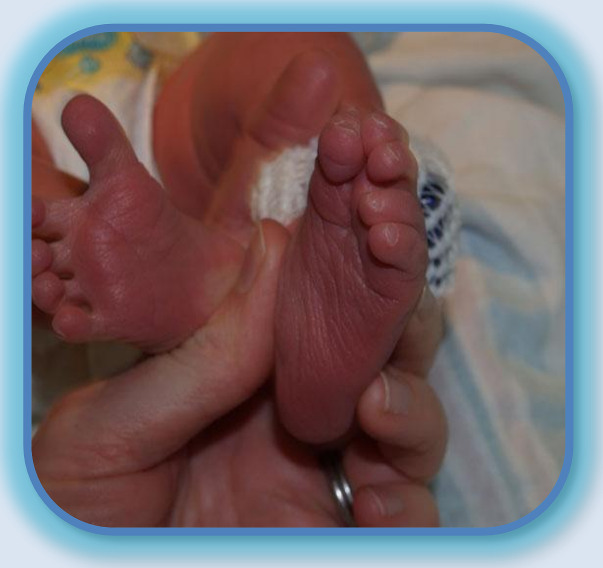
Positional Deformity of the Foot



This infant appears to have a deformity of the left foot. Although bony deformities can occur, positional deformities are much more common. The following photos will show that this position is **flexible** and is therefore due to in utero position. **Spontaneous resolution** is expected.

Positional Deformity of the Foot

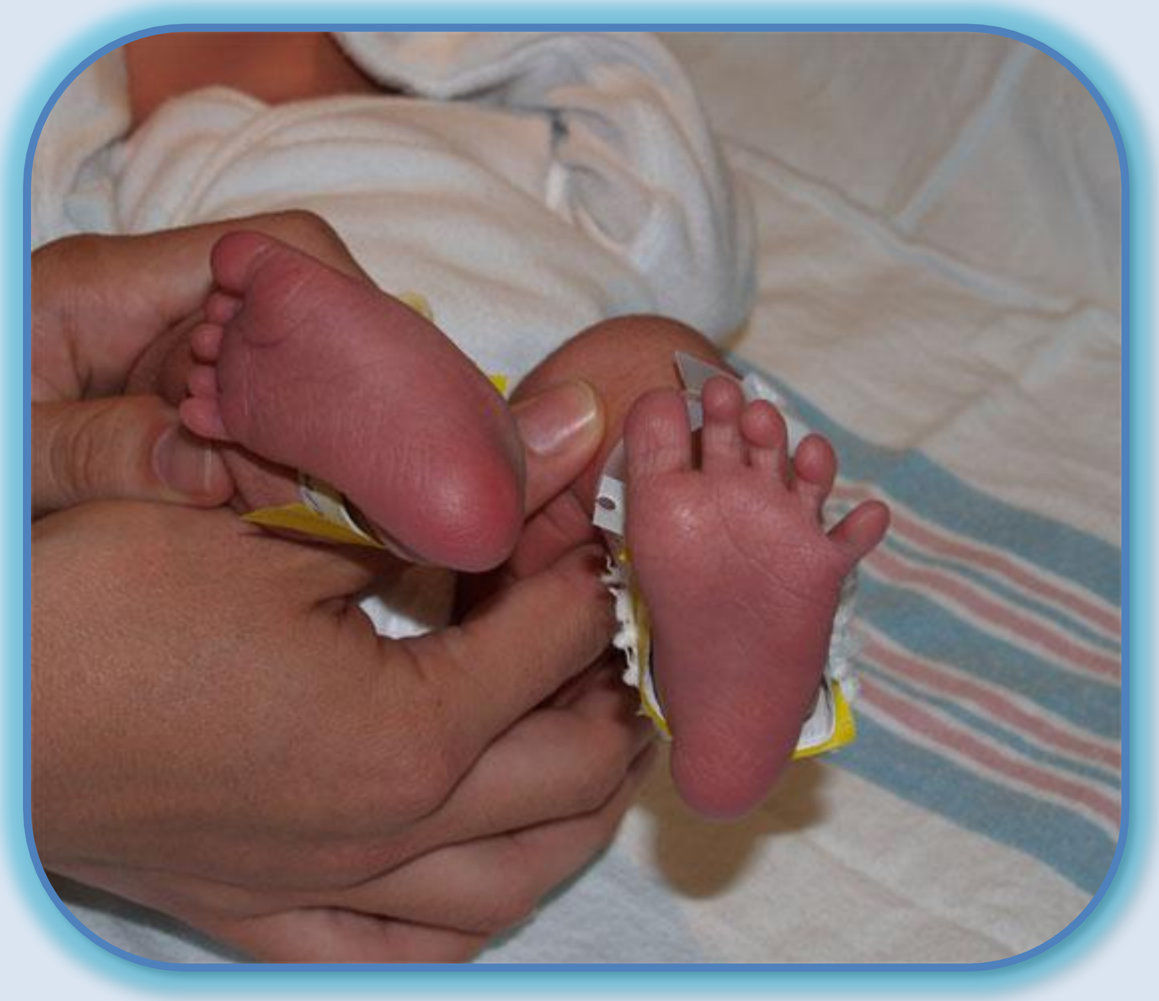




A closer view shows how the sole appears to be **everted**

With gentle pressure on the medial malleolus and the lateral aspect of the sole, the foot can be easily brought into a neutral position.

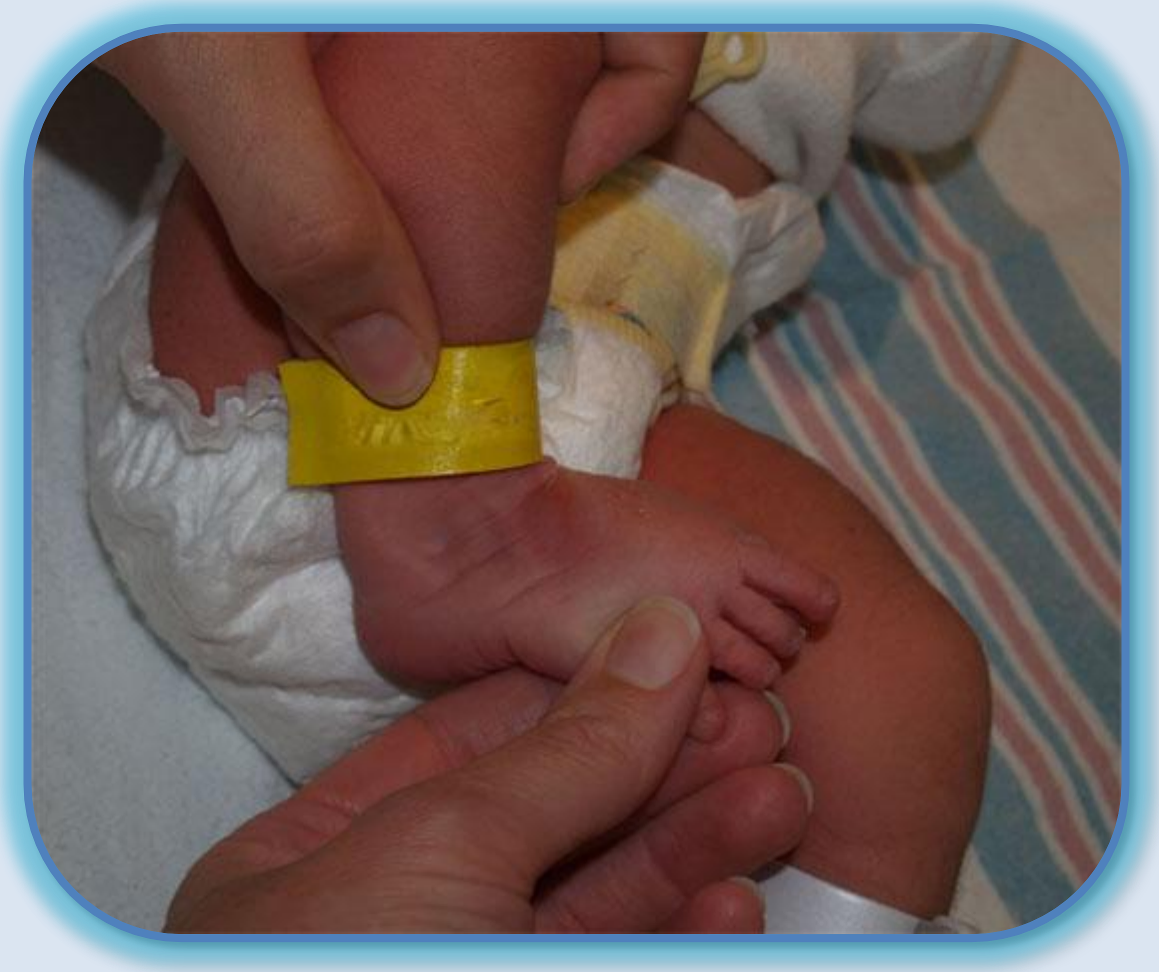
Positional Deformity of the Foot



Another example of a positional deformity.

In this case, the foot is **dorsiflexed** to such a degree that it is almost flat against the lower leg.

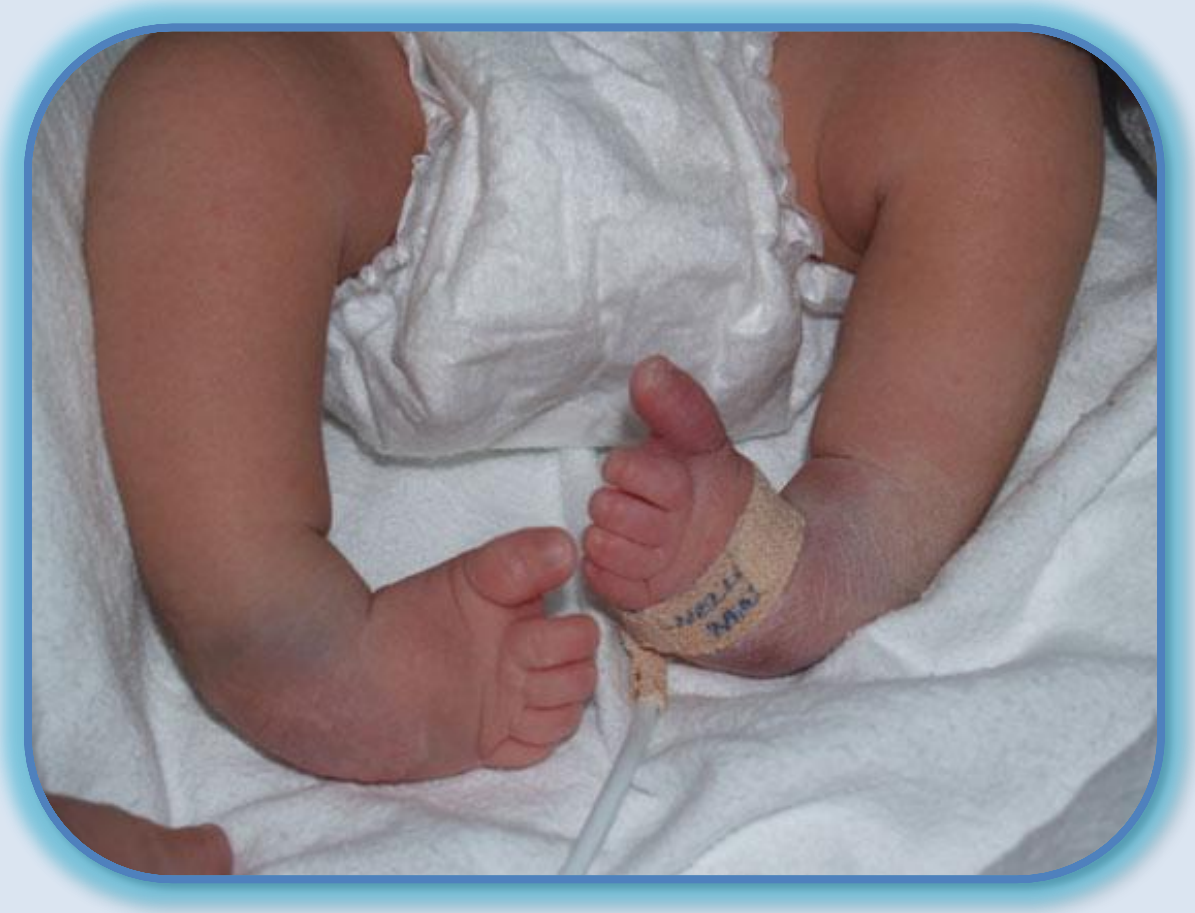
Positional Deformity of the Foot



Here again, the foot can **easily be brought back to a neutral position**. A concavity due to the unusual position can be seen near the ankle, but this will resolve as the infant has full range of motion of the foot.

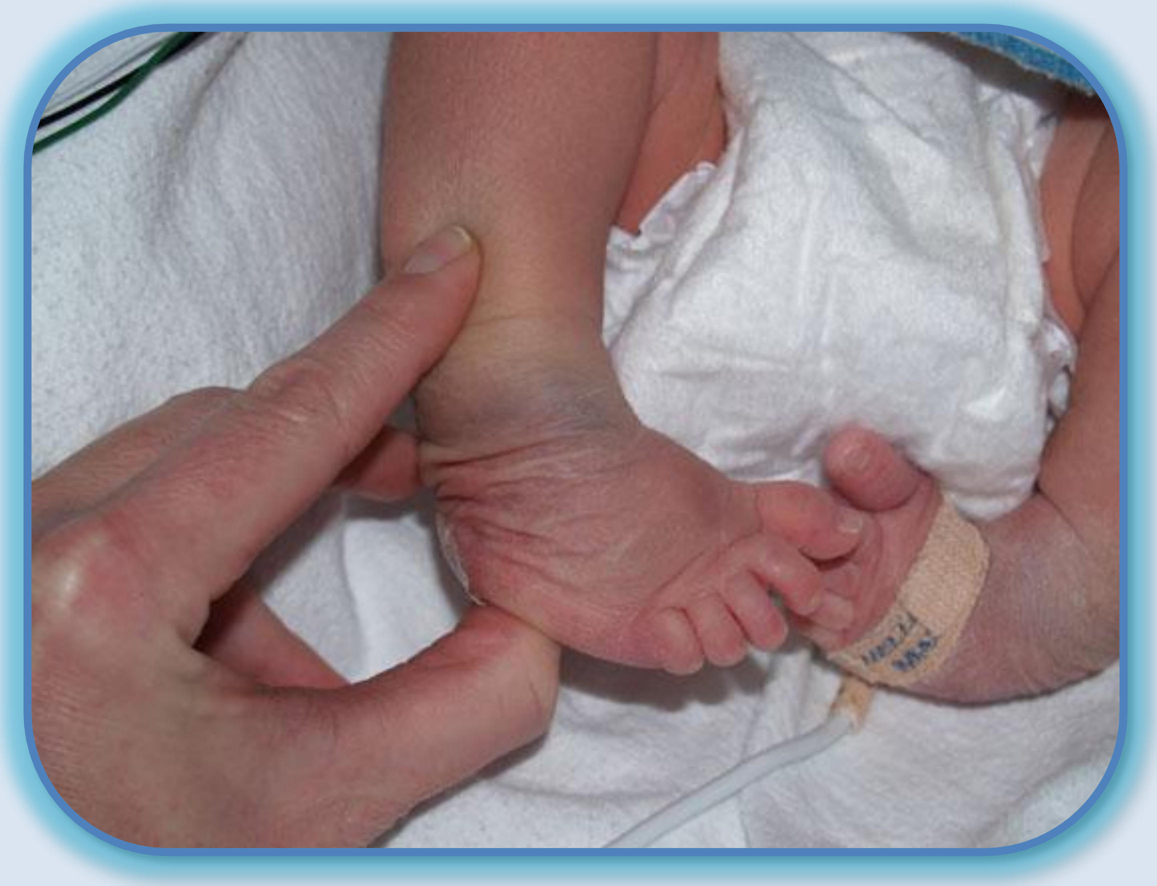
In some cases, **physical therapy** that involves stretching and range of motion exercises can help speed progress.

Club Feet



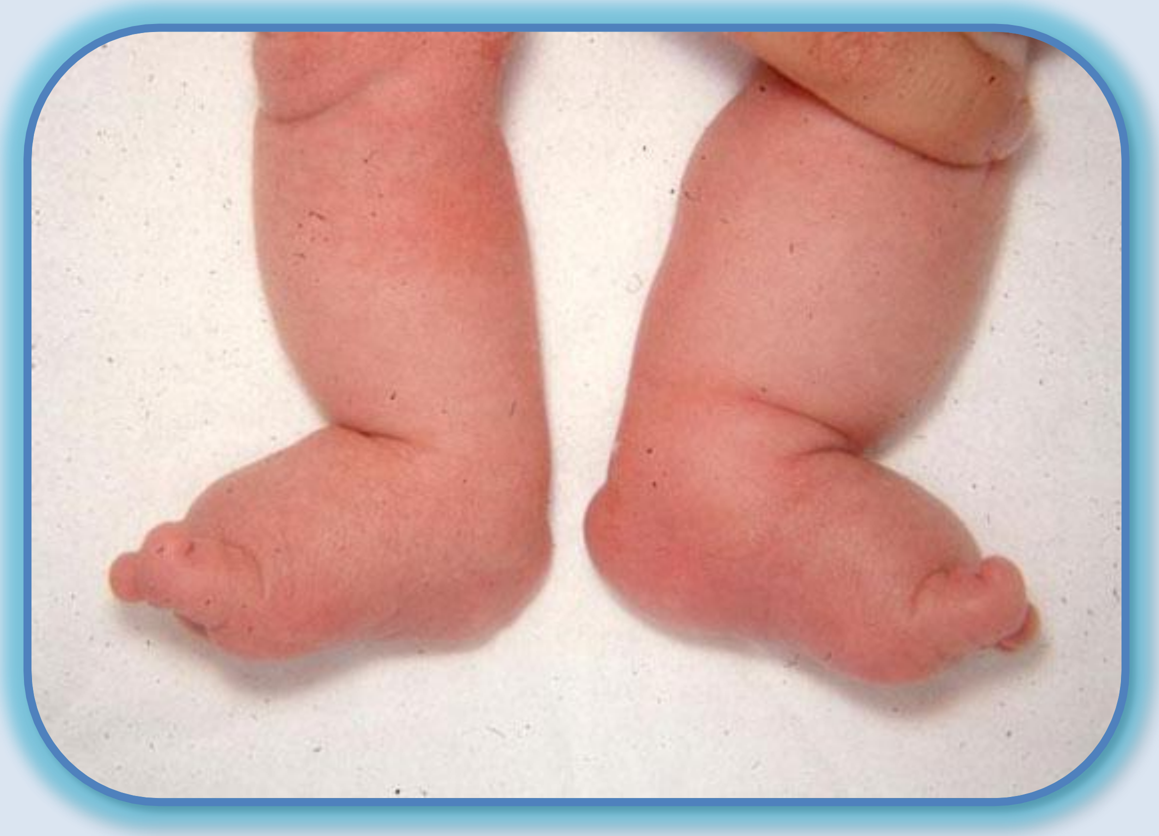
Bilateral club foot is noted in this infant. The **feet are plantar-flexed and inverted**. Because this is a **bony deformity**, this position is rigid.

Club Feet



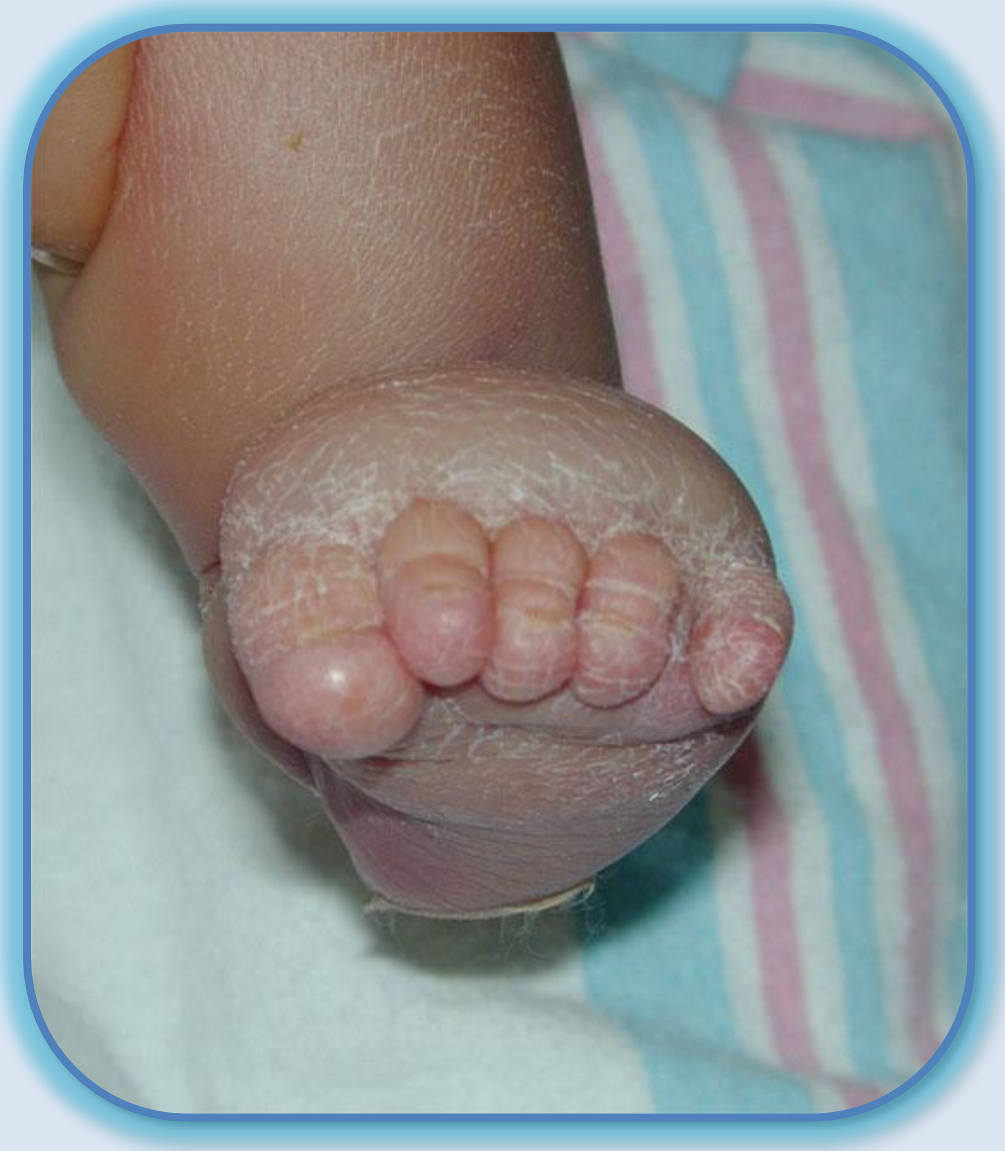
With an attempt to bring the foot to neutral position, the rigidity of the ankle is apparent. Although the skin is sliding and wrinkling, the actual position of the foot is not changed. The dark discoloration around the ankles are slate grey patches **(Mongolian spots)**, not bruises.

Edema of the Feet



In this infant, the feet and lower legs seem unusually puffy. Although edema in general has a long list of possible etiologies, **it is helpful to begin by determining if the edema is generalized or localized**. Edematous hands and feet in particular are known to be **associated with Turner's syndrome in infancy**, so this diagnosis should be considered **in girls** with this finding. In this case, Turner's syndrome was the underlying etiology.

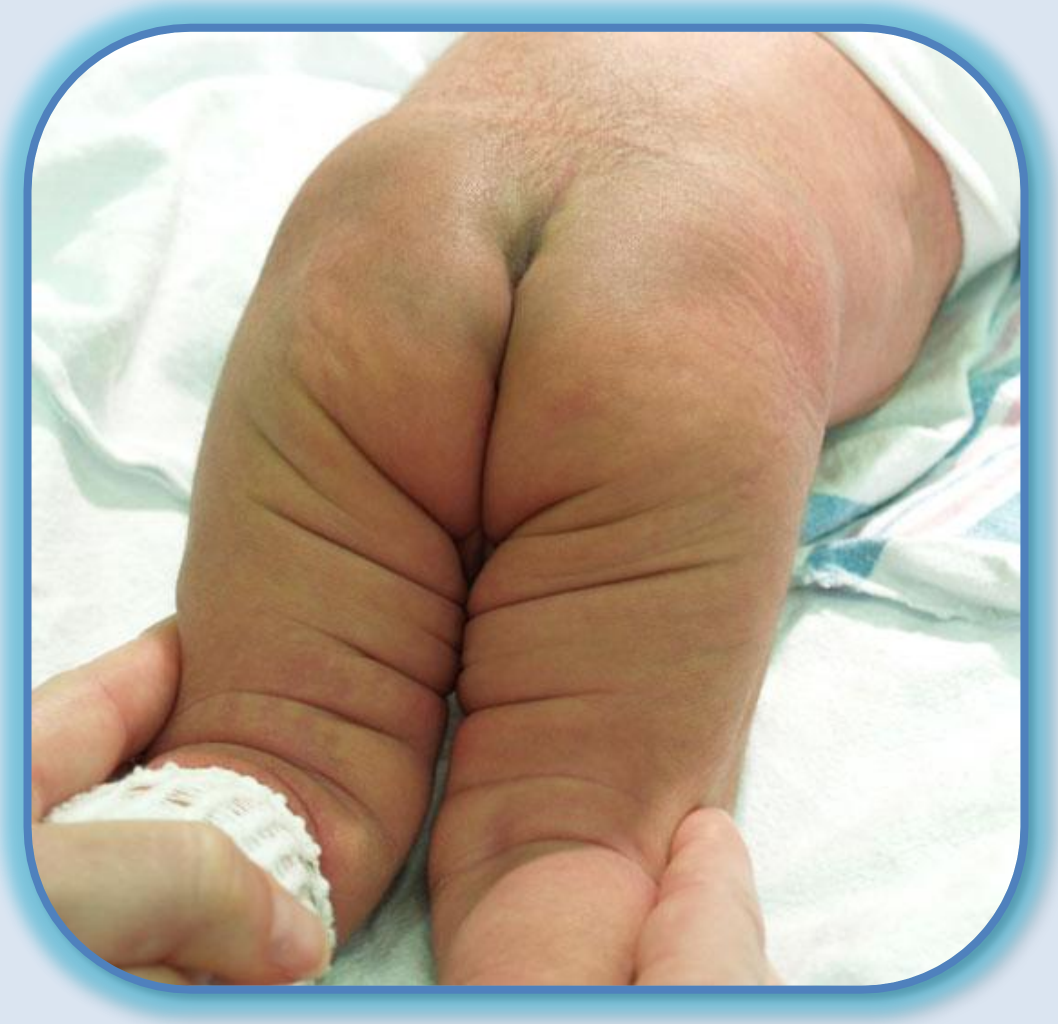
Edema of the Feet



Here is another baby with **edematous feet** as a result of **Turner's syndrome**. From this angle, the excessive puffiness behind the toes can be easily seen.

Hips

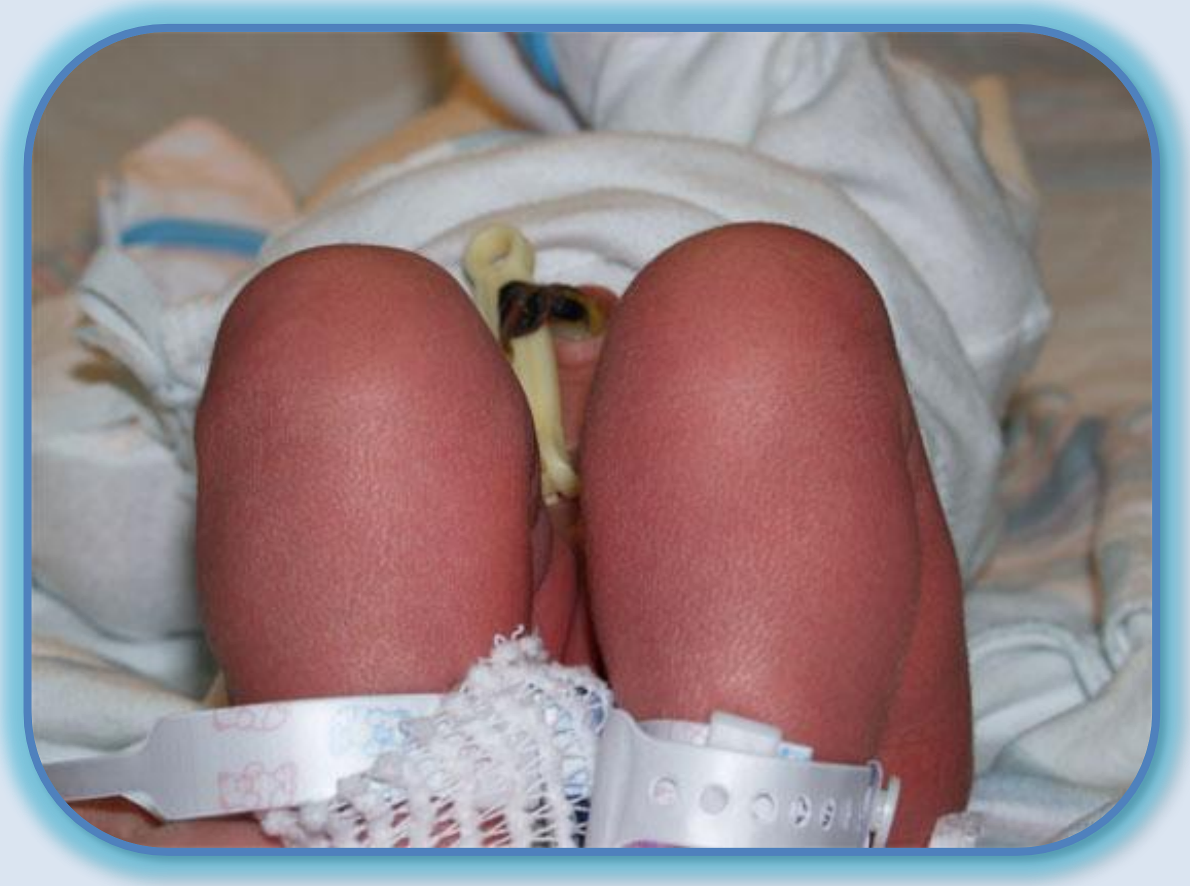
Leg Creases



Looking for asymmetry between the major creases in the thighs is **another way to evaluate for Developmental Dysplasia of the Hip**.

This infant appears to have some asymmetry of the most superior creases. Initially, some slight amount of subluxation was felt on the **Barlow exam** in this baby. This finding is more useful in older children as **25% of infants with normal hip exams may also have asymmetric creases**.

Galeazzi Sign



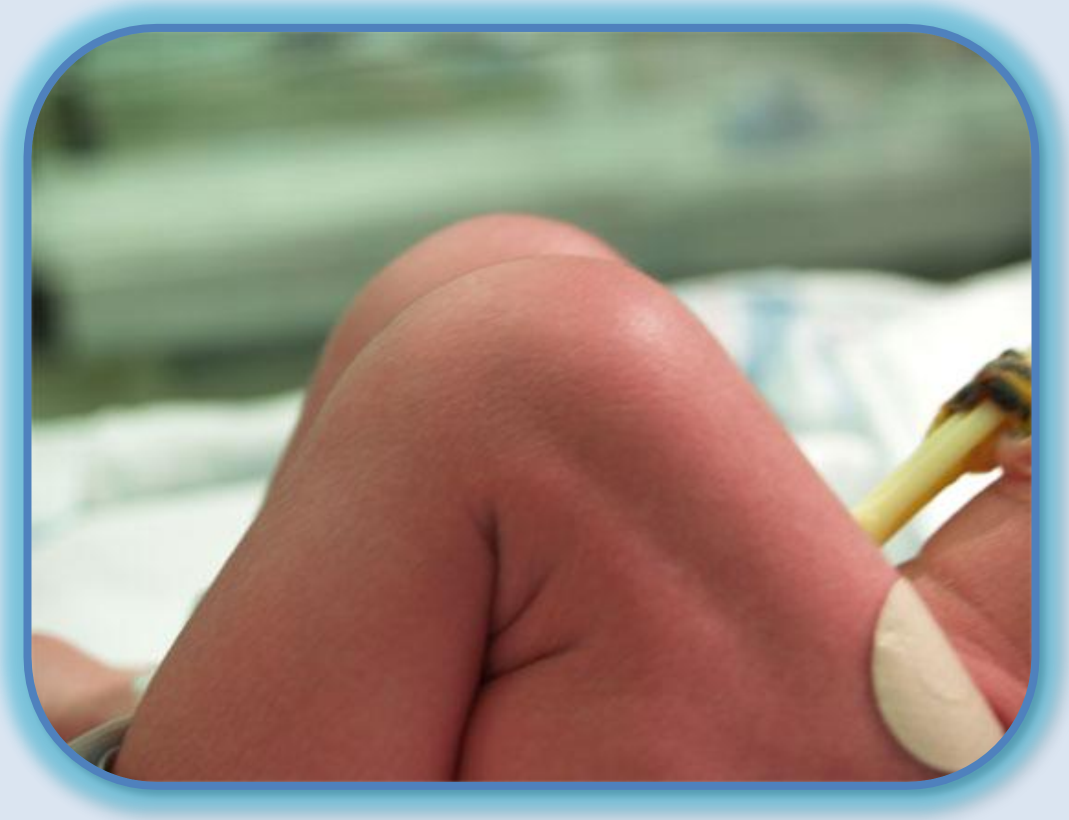
Hips can also be assessed by **looking at the symmetry of the height of the knees when the infant is supine**.

A **positive** galeazzi sign (**unequal** knee heights) suggests a unilaterally dislocated hip.

It is important to remember that bilateral dislocations will likely appear symmetric, so this assessment should only be used in combination with the Ortolani and Barlow maneuvers.

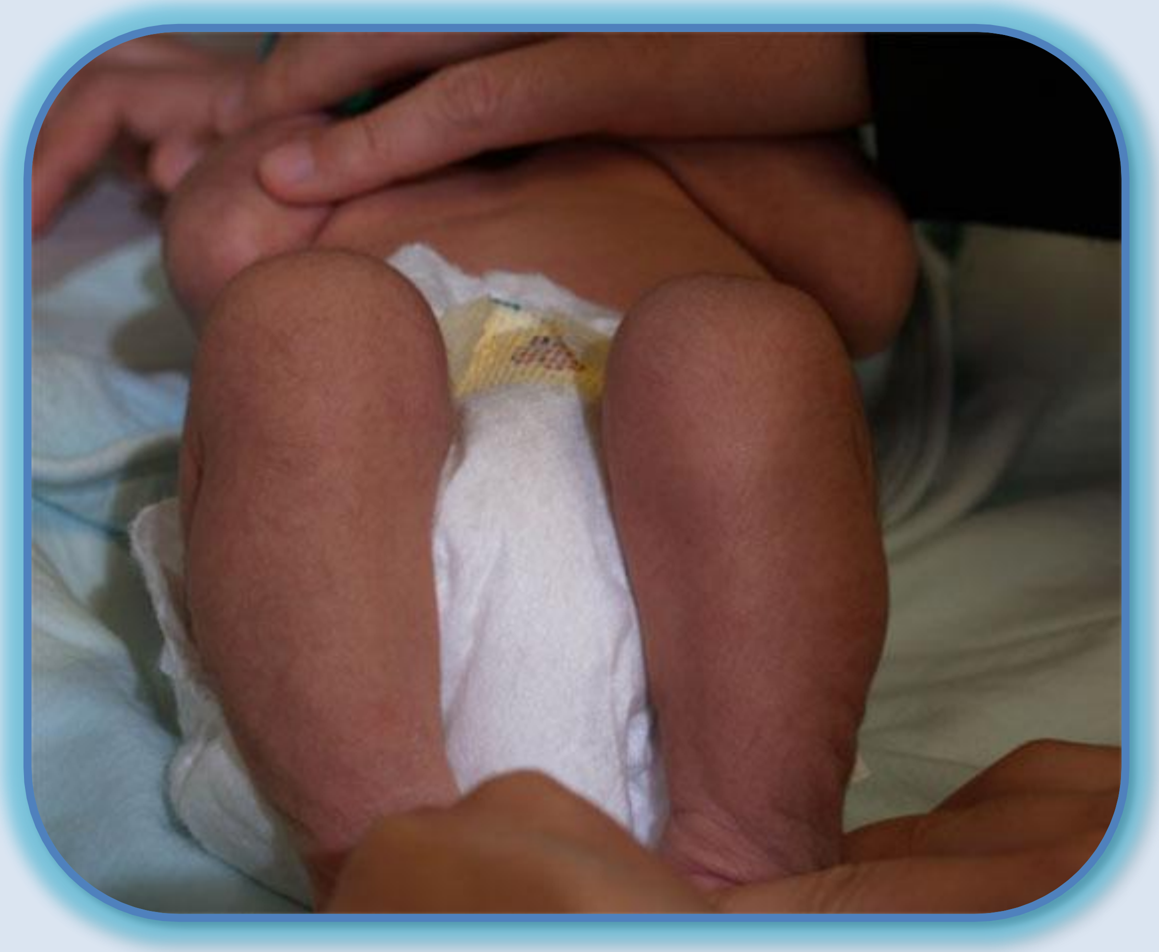
The infant in this photo has a **negative** galeazzi sign (the hips are **normal**).

Galeazzi Sign cont...



With a **side few** of the same infant in the previous photo, the knees still appear **symmetric**. Again, this is a **negative** Galeazzi.

Positive Galeazzi Sign

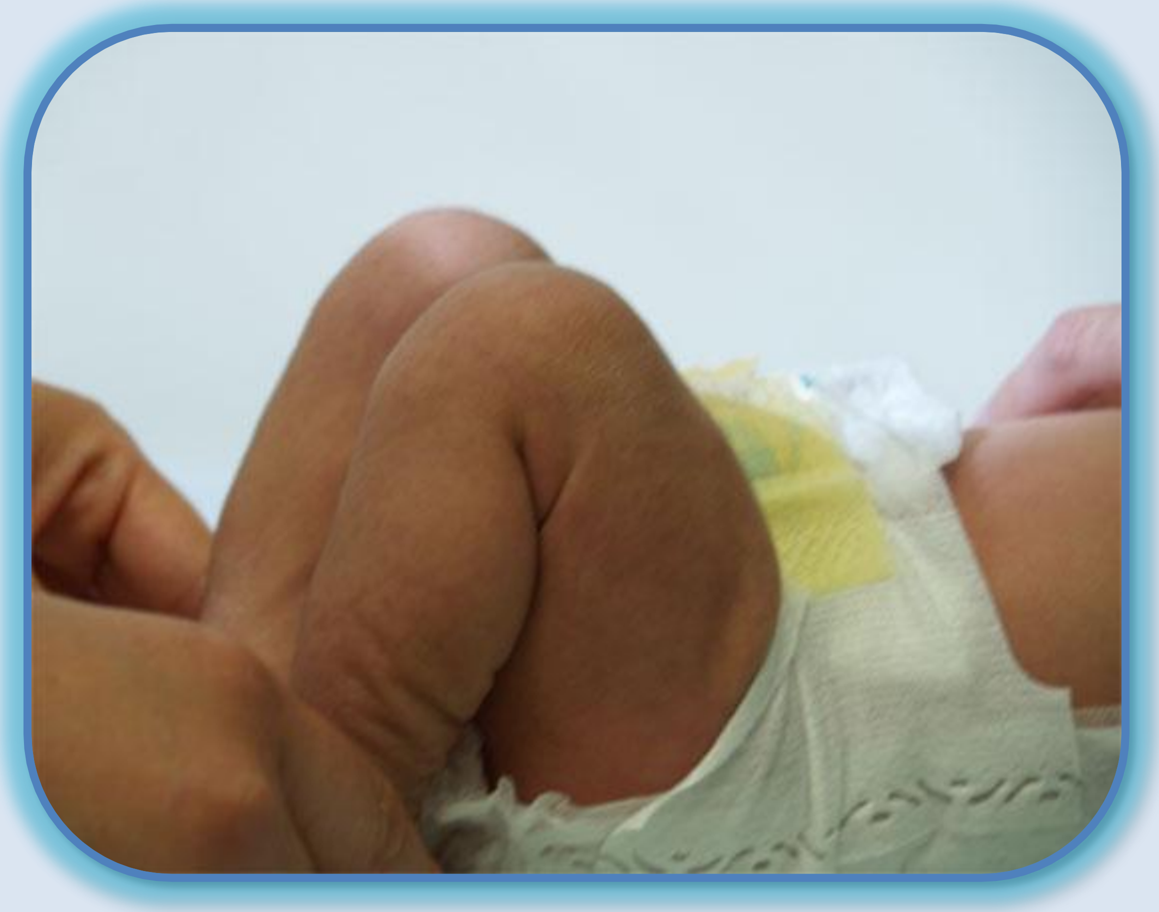


In contrast, this infant has a **positive** Galeazzi sign.

With both feet placed firmly on the table, the knees are **not symmetric**. This finding is usually caused by a **dislocated femoral head** which is situated posterior to the acetabulum, instead of in the acetabular fossa. This creates a shortened appearance of the thigh on the affected side.

In this case, the left hip was the abnormal one.

Positive Galeazzi Sign cont..

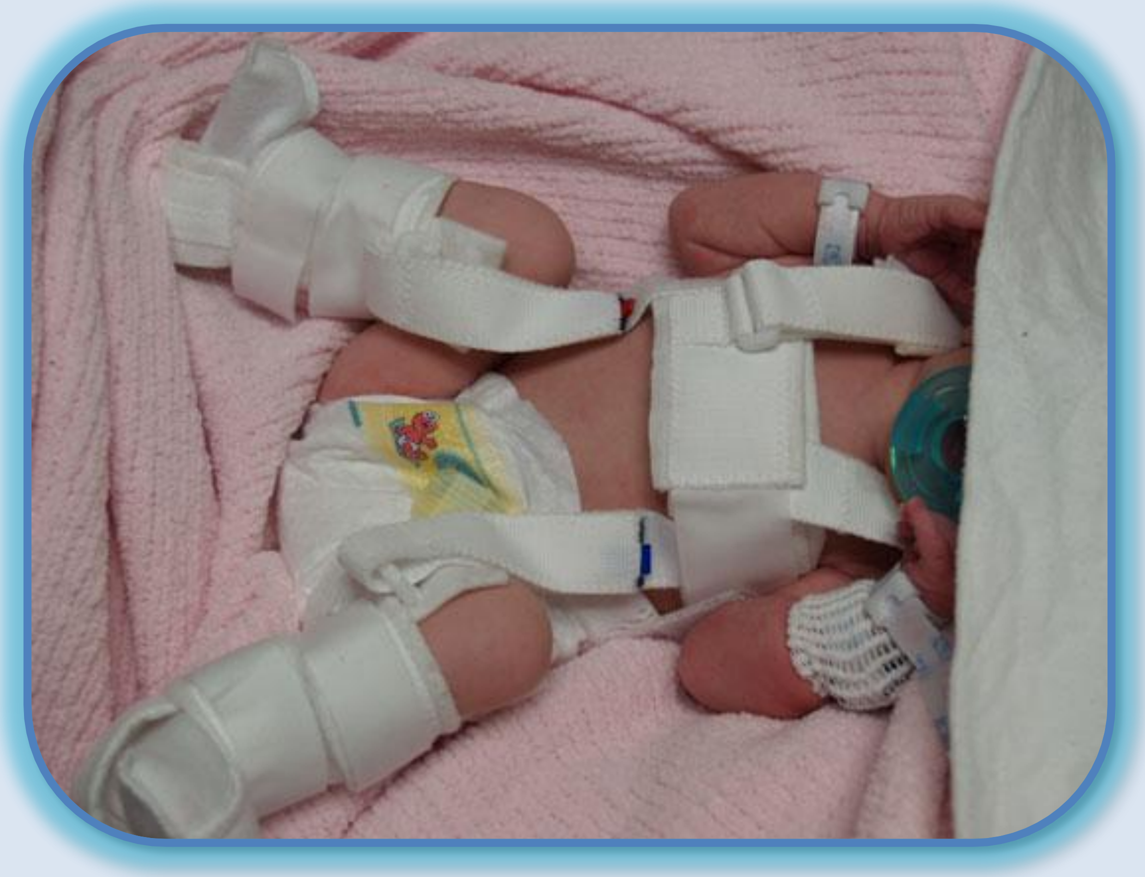


This is the side view of the same infant as in the previous photo.

Again, the left knee is slightly lower than the right (although in this view the difference seems less pronounced).

This infant was treated with a **Pavlik harness** and did well.

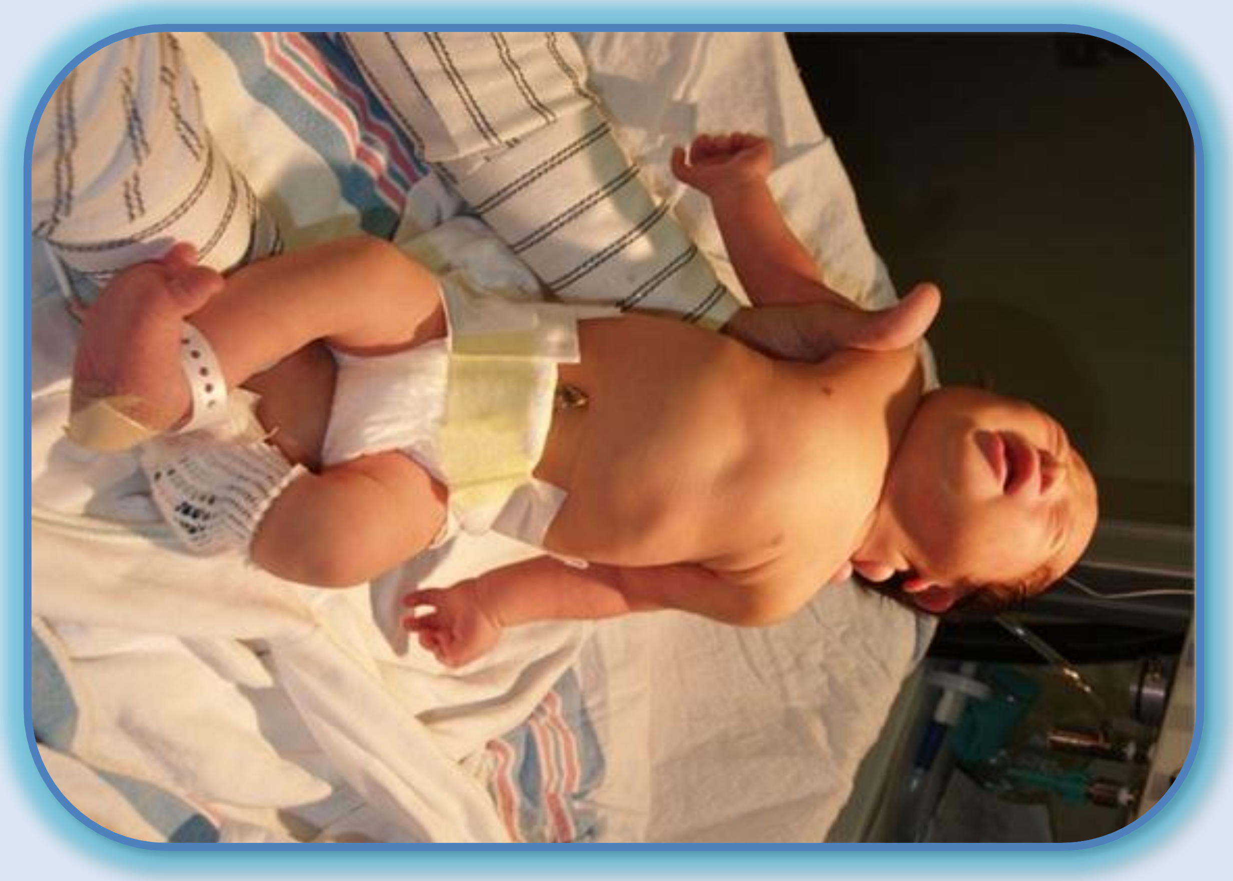
Pavlik Harness



When instability of one or both hips is noted, an orthopedic consult should be obtained. In many cases, a Pavlik harness will be placed before the infant is discharged from the hospital. While it is a Velcro apparatus and can be easily removed, the family is frequently instructed **not to remove** it for some time, so care should be taken to ensure that all newborn bands are removed from the ankles first.

Neuro

Hypotonia

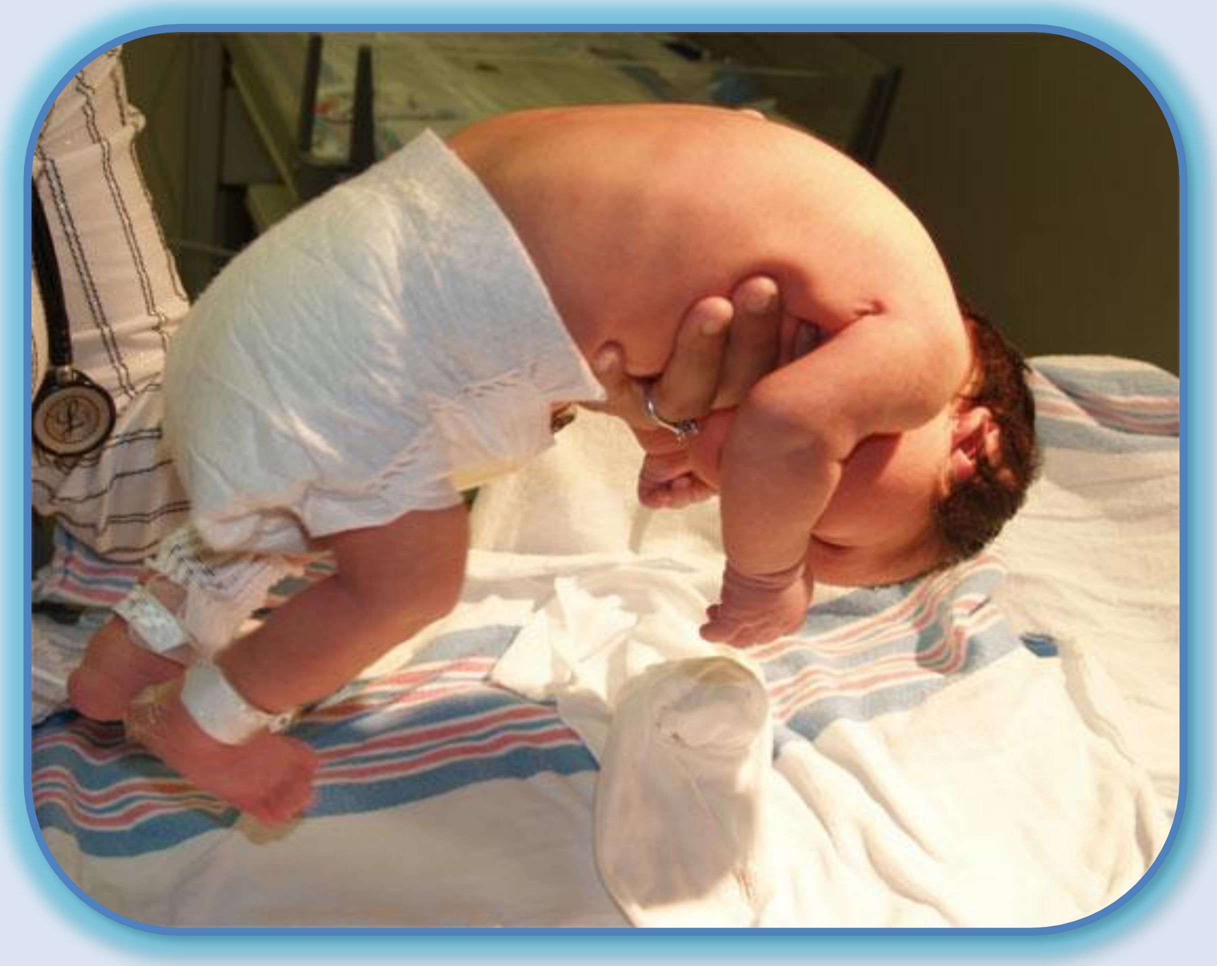


The assessment of tone can be made both from **observing the posture and activity** of the infant when undisturbed and also by handling the baby.

Infants with normal tone will not feel **"floppy"** when held by the examiner.

The infant in the photo above is hypotonic. When this baby was lifted, the examiner had to give much more support to the head and shoulders than is usual to keep the infant from sliding from her hands. Notice how both arms fall back (instead of being held in flexion), and the baby's chest seems to drape over the physician's hand.

Hypotonia

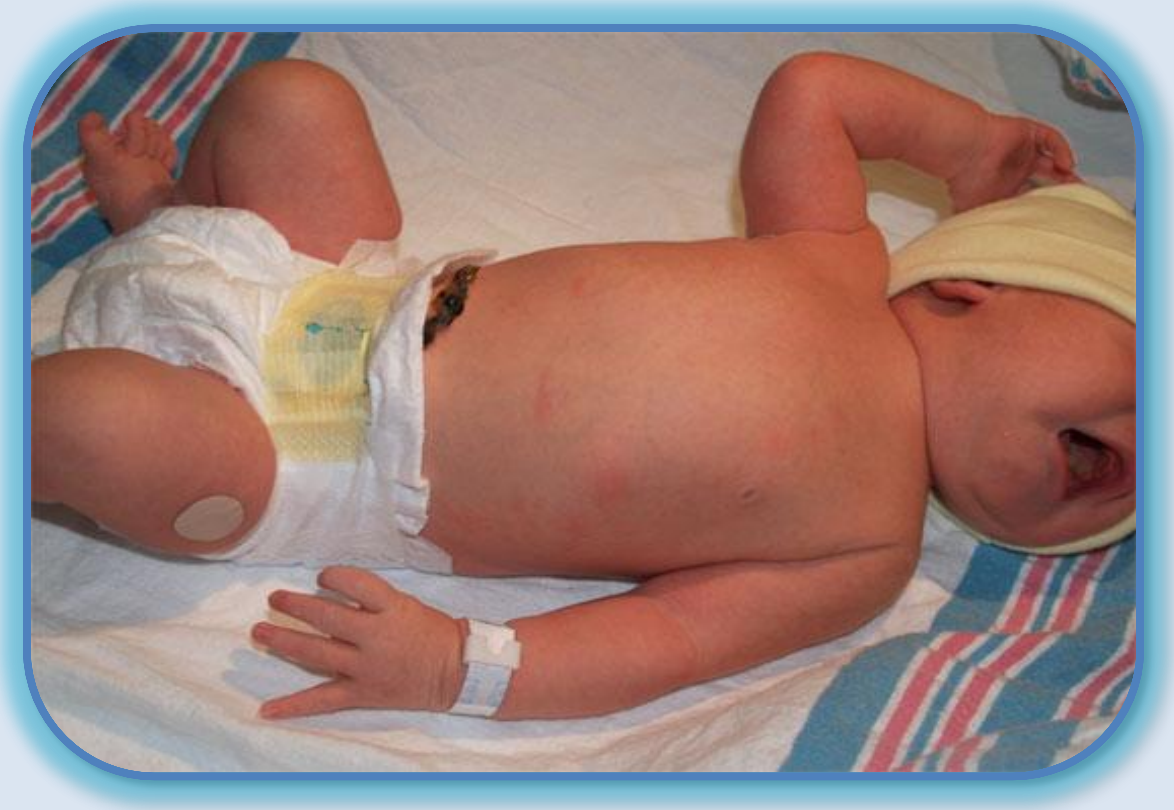


Here is the same infant held in **ventral suspension**.

Normally newborns do have a convex curvature of the spine in this position, **but not to this degree**. Here the **head drops** much lower than one would expect, and the examiner has the sense that the infant could **easily slip out** of her hand without extra support.

In this case, the hypotonia was caused by trisomy 21.

Erb's Palsy



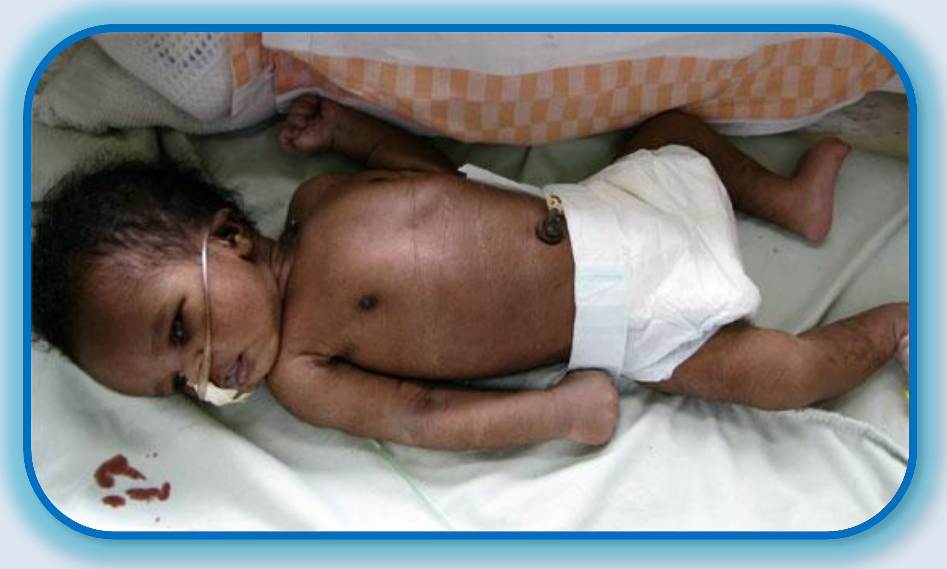
When **shoulder dystocia** occurs during the birth, injury to the **brachial plexus** can occur.

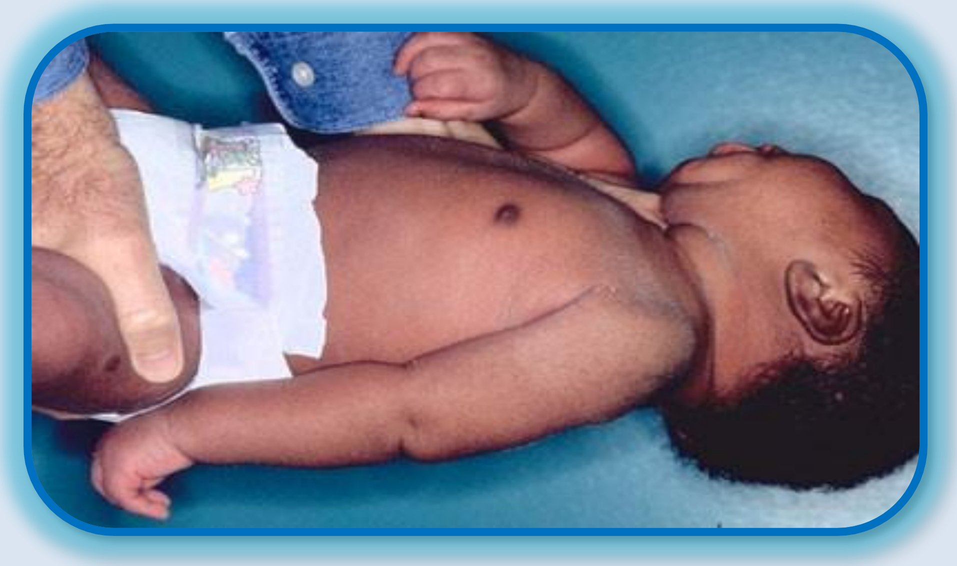
This photo shows how the **posture of the arms is asymmetric**: the left arm is at the side and the hand is medially rotated at a time when the other arm is flexed with crying.

Testing the **Moro (startle) reflex** in this infant produces a similar result as the left arm does not raise as high as the right.

Most brachial plexus injuries of this type **resolve** spontaneously. Improvement in movement can often be noted within the first 24 hours. **If** improvement does not occur, referral to a pediatric neurologist, and possibly a physical therapist, is warranted.

Erb's Palsy

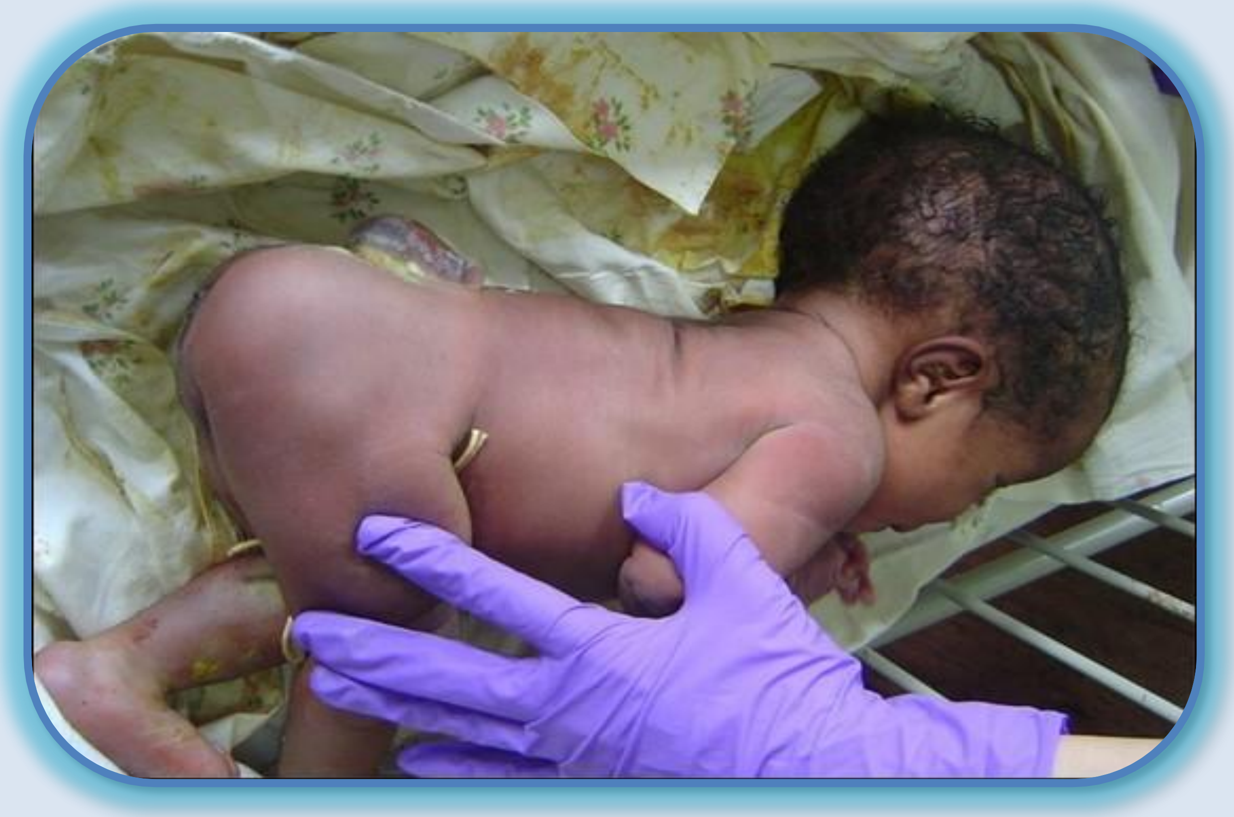




This is another example of Erb's palsy.

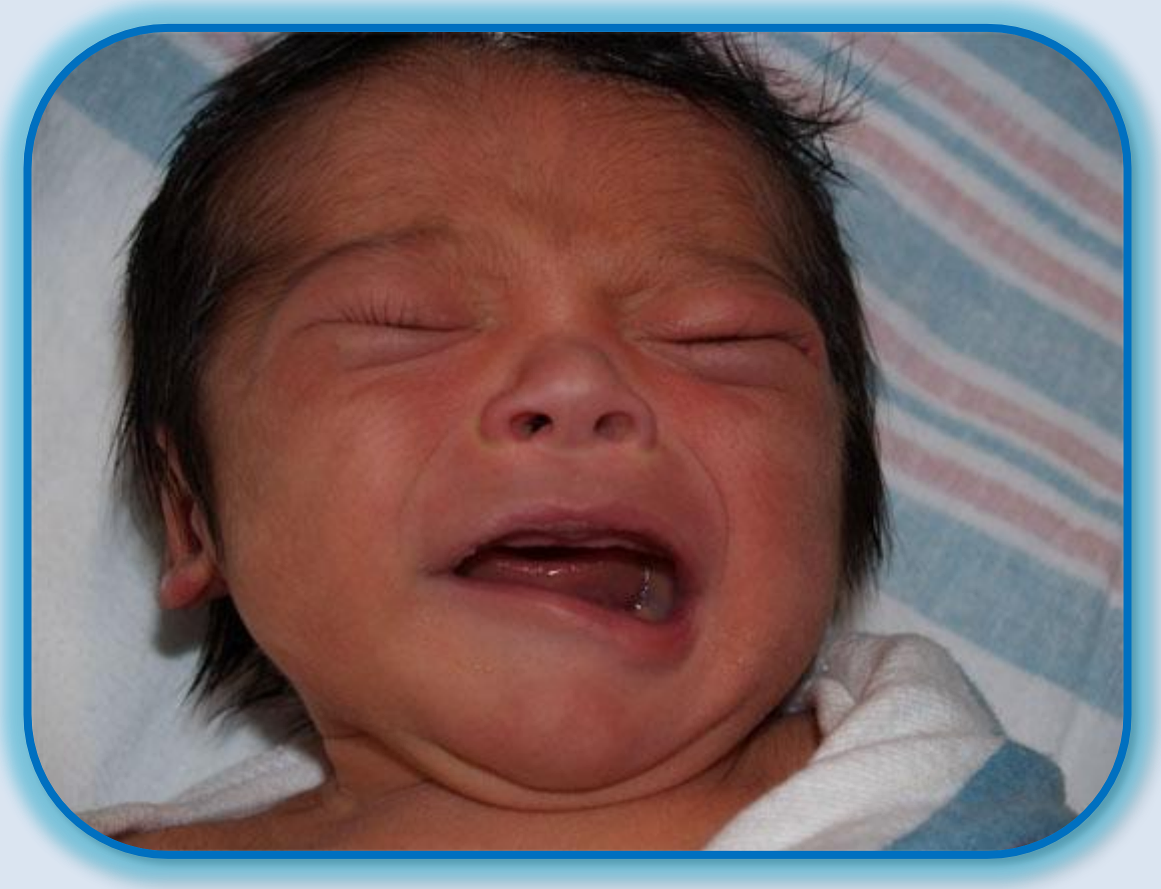
In this case, the infant's right arm is affected. When assessing movement of the extremity, look for movement, function, and strength of all three major joints (shoulder, elbow and wrist) as well as the hand grasp.

Meningomyelocele



It is a type of neural tube defect that results from incomplete closure of the posterior spine during early development. The visible mass contains dysplastic spinal cord as well as meninges, nerve roots, and CSF. The **lumbar spine is the most common** location for this abnormality. When this diagnosis is made prenatally, caesarian section is usually recommended, and the birth is planned at a location where a pediatric neurosurgeon and level 3 NICU are available. At delivery, the defect can be protected with sterile saline-soaked gauze, covered by plastic wrap, and the infant kept in a side-lying or prone position. Infants with this condition frequently have **associated abnormalities**; **Arnold Chiari malformation**, dislocated hips, bowel or bladder dysfunction, and lower extremity weakness are all common co-morbidities.

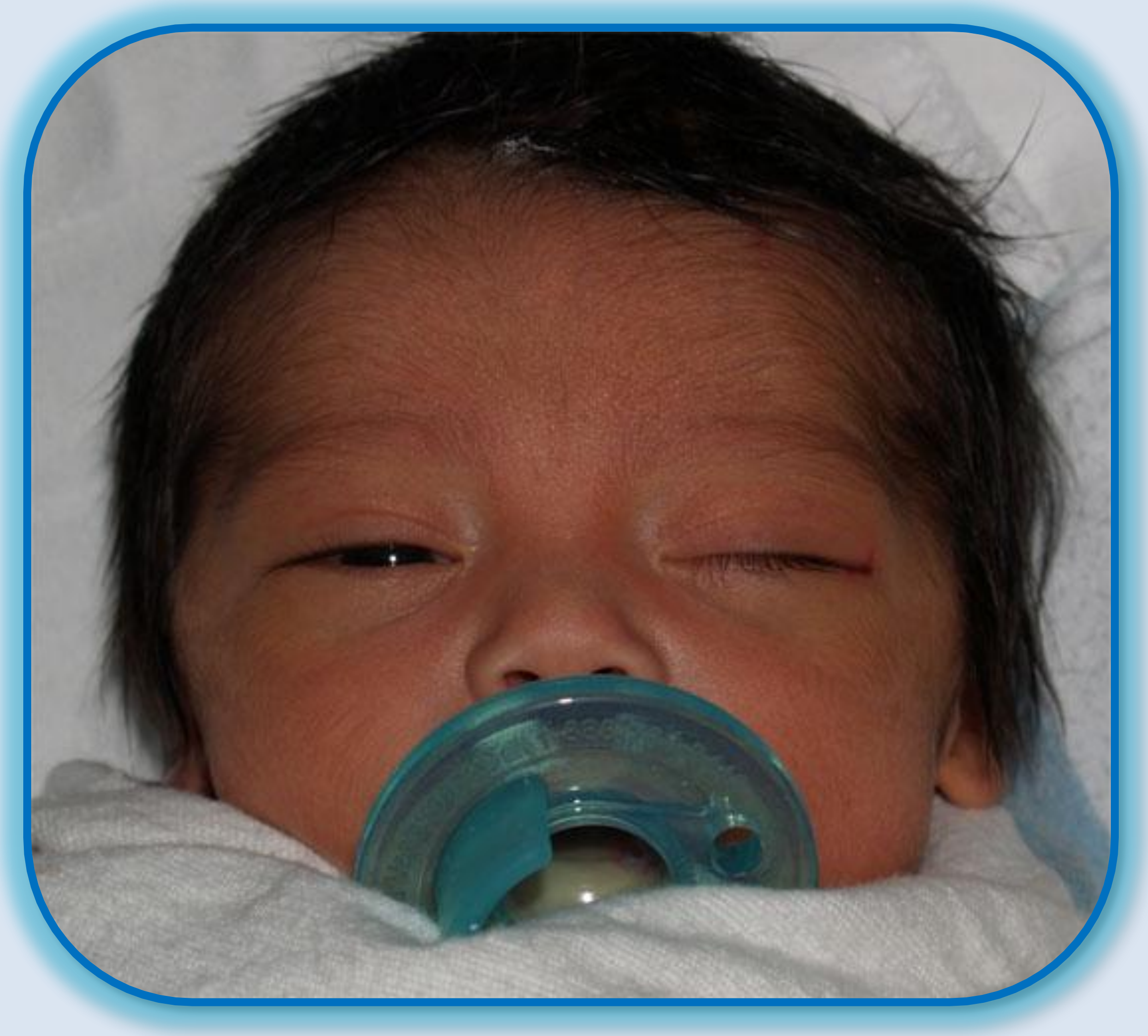
Facial Nerve Palsy



This newborn was delivered by **forceps** assisted vaginal delivery. There were small abrasions present on the left lateral eyelid and anterior to the right ear. The right facial nerve is affected here.

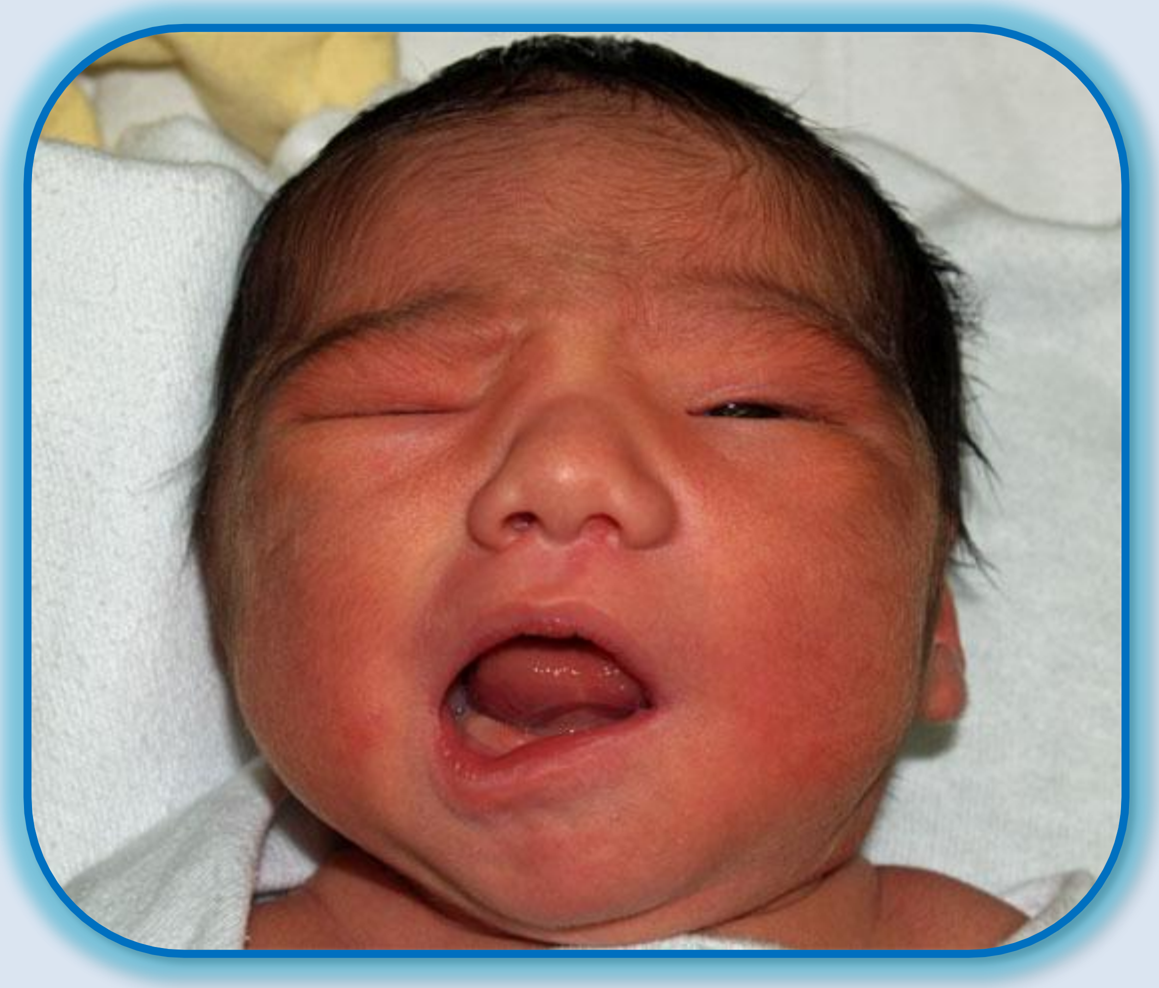
In an infant who is **crying**, the lower lip should be pulled down by the action of the facial nerve, but in this baby, the lip is pulled down only on the left and an **asymmetry** results. **Spontaneous resolution** is expected.

Facial Nerve Palsy



When the baby is quiet, asymmetry in eyelid closing can more easily be seen. As the baby was resting, so both lids should have been closed. Instead, the lid on the affected side (Right) is partially open. Involvement of both the eye and lip help differentiate facial palsy from other diagnosis, such as asymmetric crying facies.

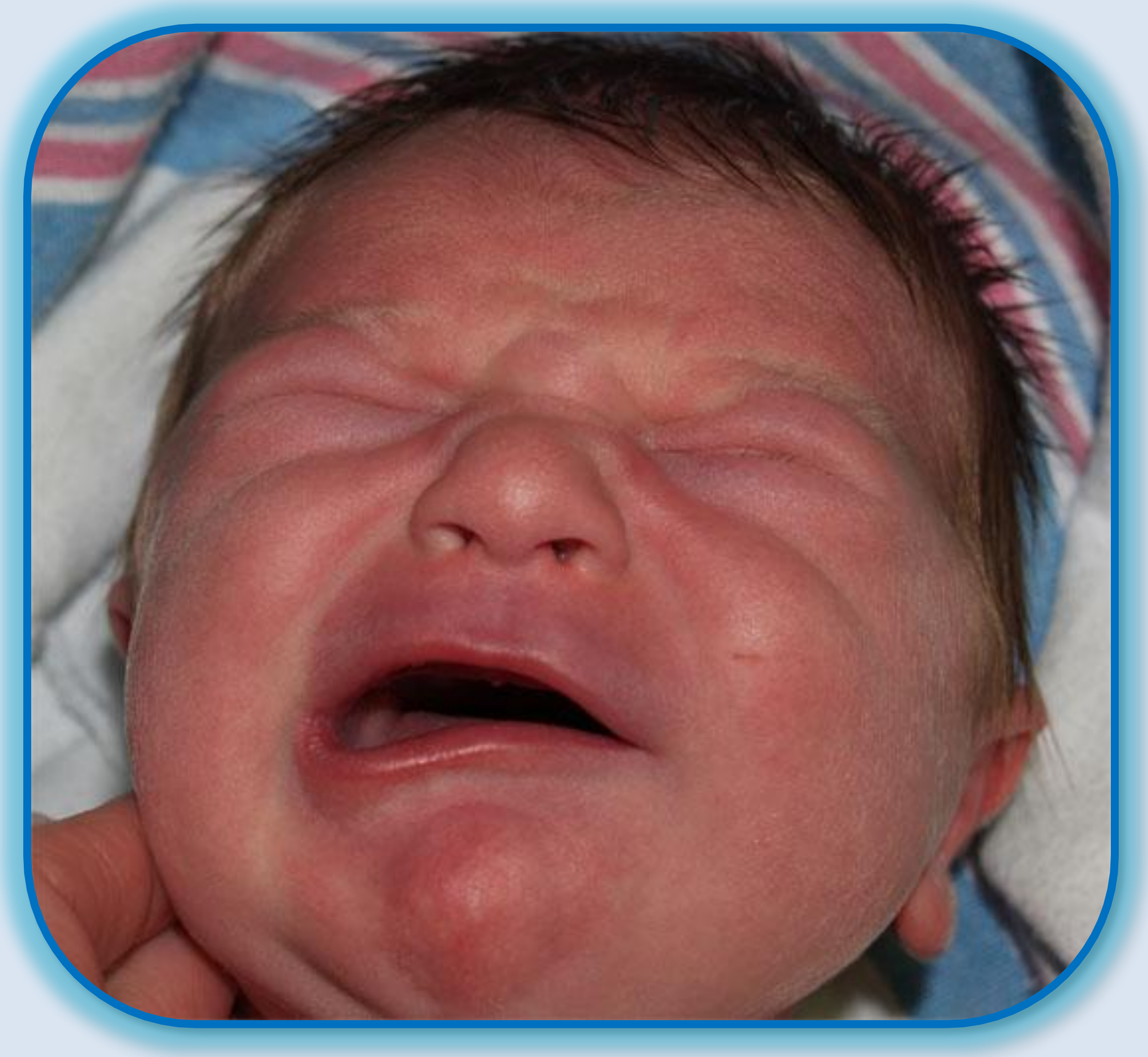
Facial Nerve Palsy



This infant has left facial nerve palsy. Here, both the abnormal lip and eyelid positions can be seen.

When the eyelid does not completely close, it is important to **protect the eye** with a lubricant to prevent corneal abrasions.

Asymmetric Crying Facies

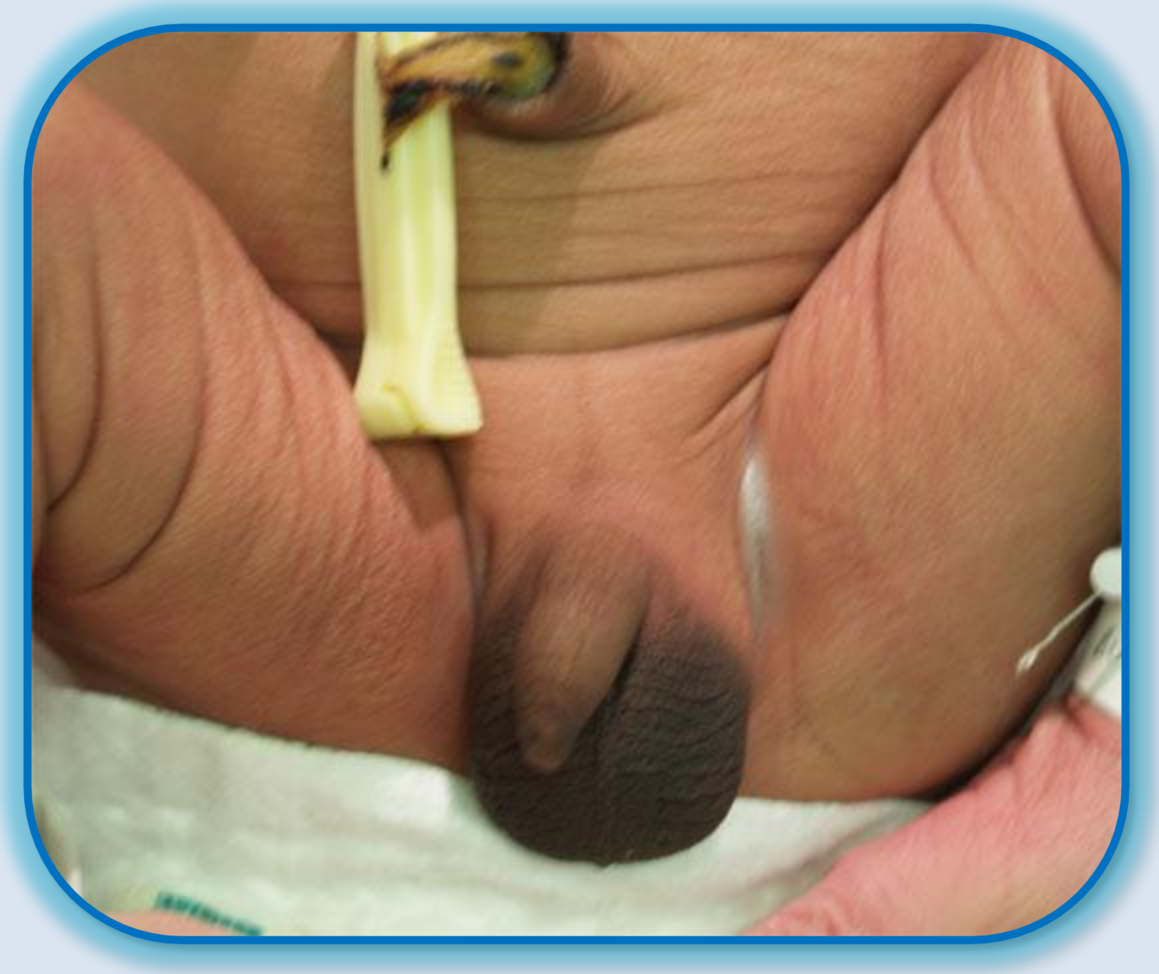


This infant has asymmetric crying facies. This condition can be differentiated from facial nerve palsy in that the eye and forehead muscles are unaffected. The etiology is a congenital deficiency or absence of the depressor anguli oris muscle which controls the downward motion of the lip. In this patient, the left side is affected.

In rare cases, this anomaly has been associated with cardiac or renal abnormalities or 22q11 deletion, so a careful examination is warranted.

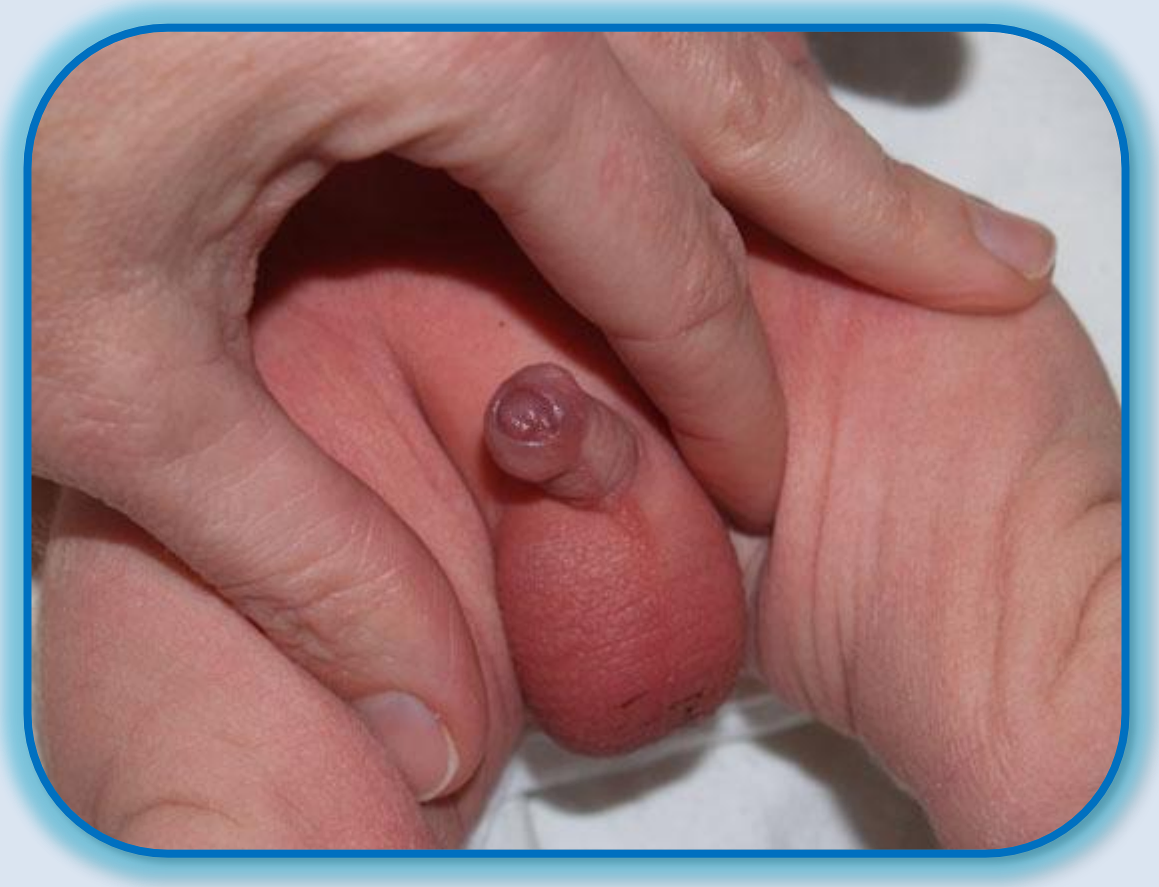
Genitourinary

Normal Male Genitalia



Normal male genitalia in a term infant. The amount of pigment in the scrotum can vary considerably, depending on the ethnicity of the parents and maternal hormone effects.

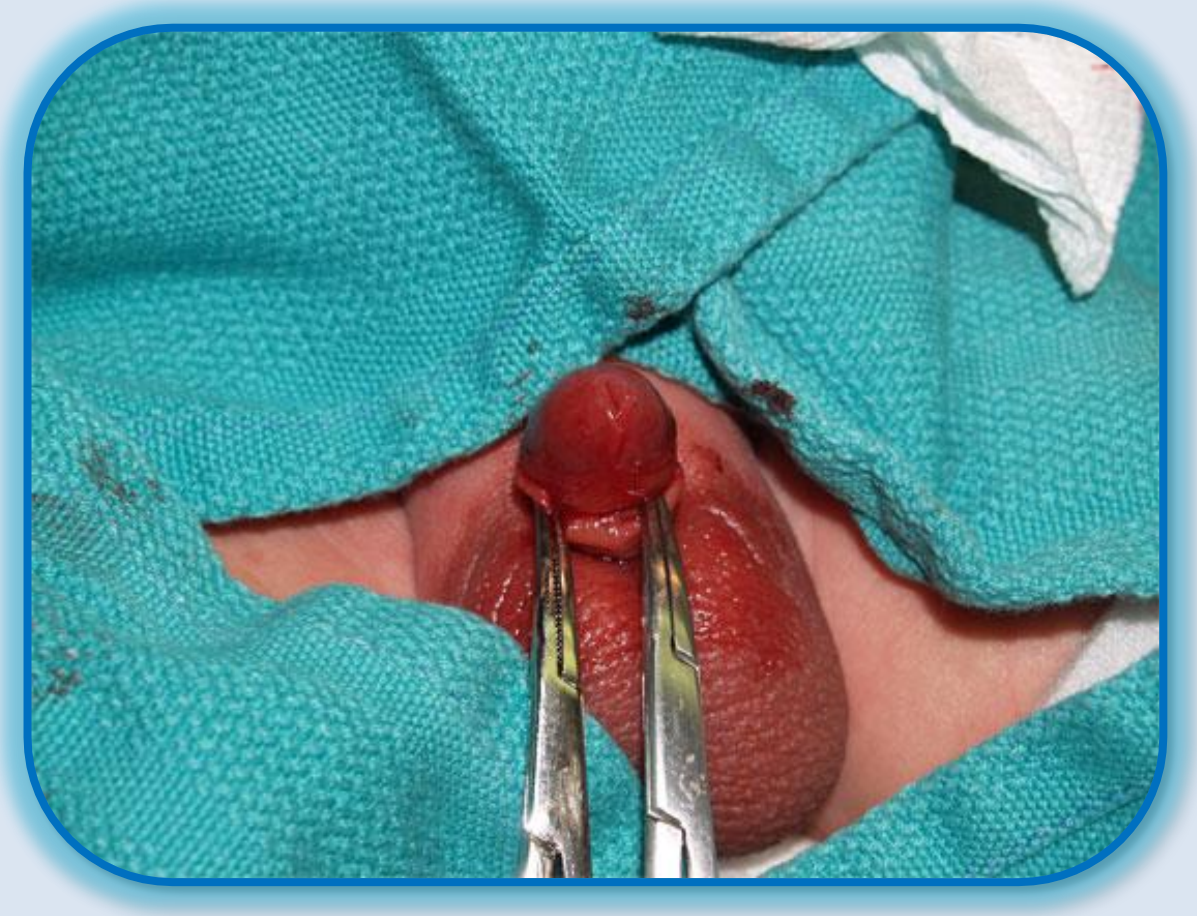
Foreskin Variant



Although the opening of the **foreskin is usually tight** enough in the newborn to preclude a view of the urethra, variability exists.

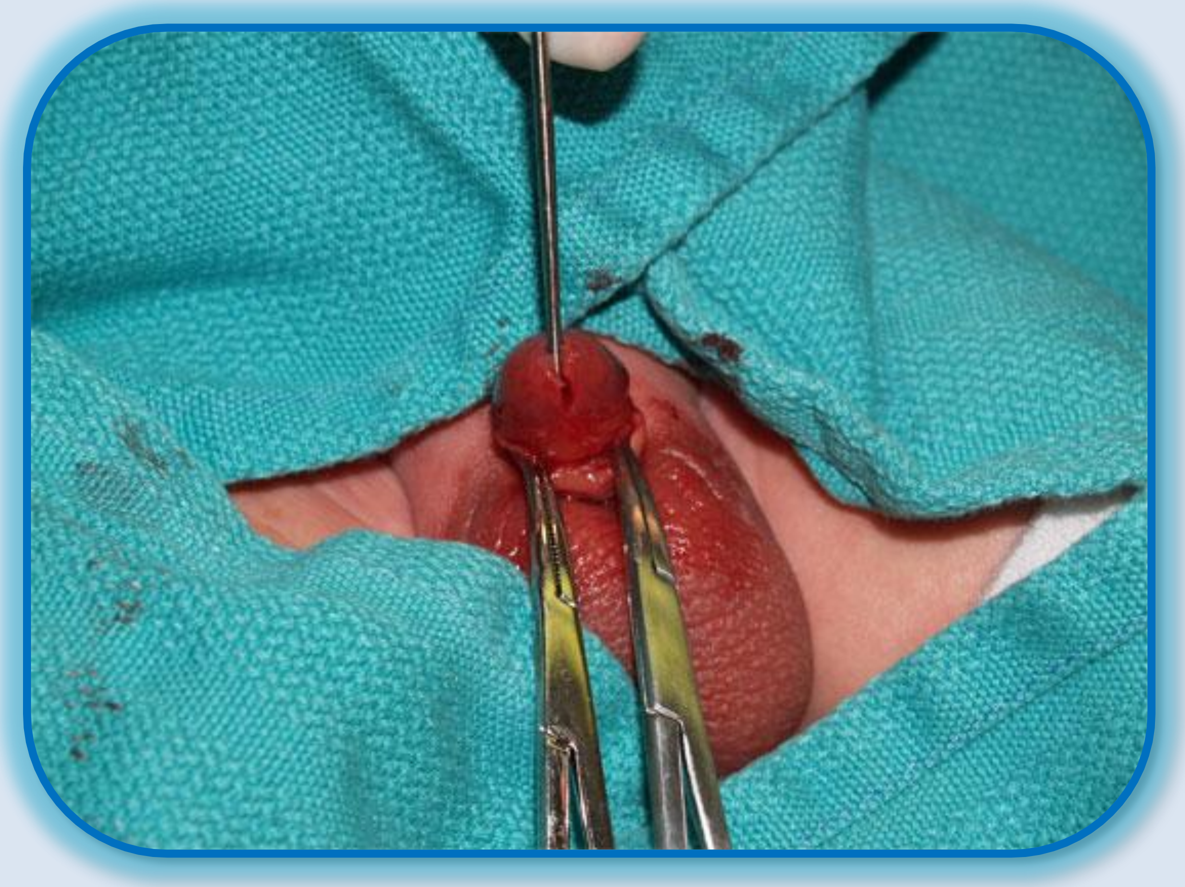
In this infant, a normal urethral meatus can be clearly seen through the wide opening of the foreskin. This is a variation of normal & no referral or intervention is necessary.

Megameatus



After retracting the skin for a circumcision, this anomaly of the meatus was noted. Although the meatus starts in a normal distal position, it extends down the ventral surface of the glans all the way to the corona. This is a **variant of hypospadias**, **but it occurs with a normal foreskin**.

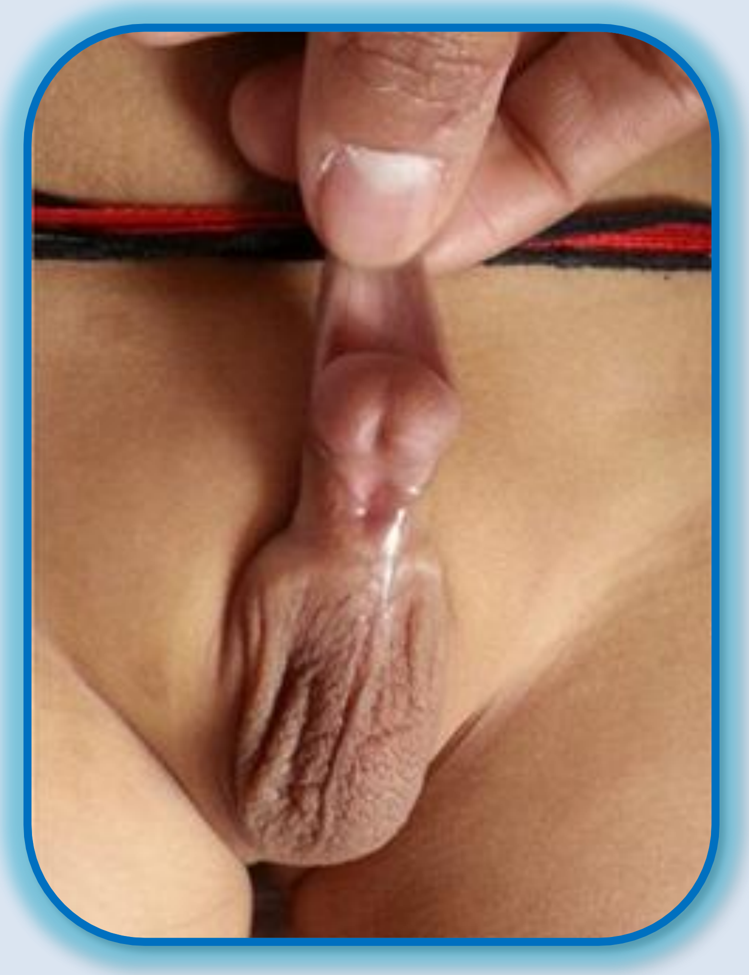
Megameatus



With use of a probe, the extent of the meatus can be more clearly seen. **Circumcision is not contraindicated in this case**.

There is **no functional problem** with this abnormality in the newborn period; **repairs** are usually planned when the infant is **several months old**, as the risk of general anesthesia is less at that age.

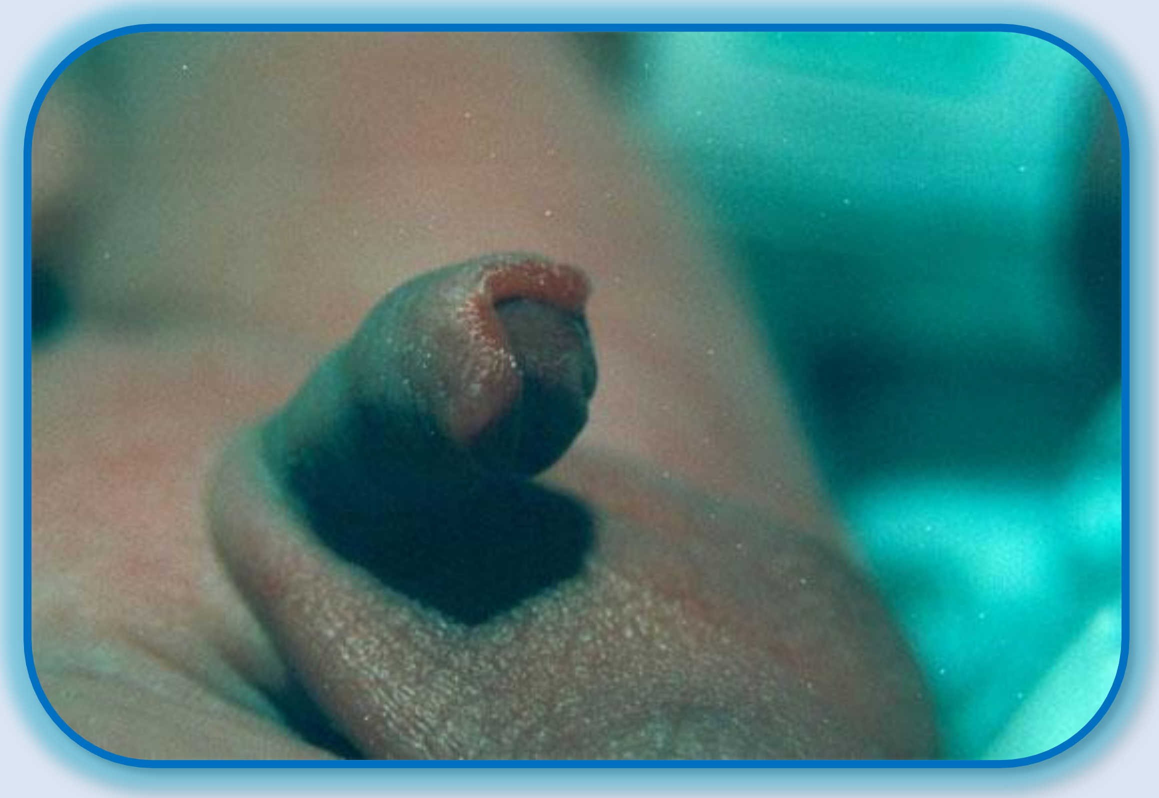
Hypospadias



Hypospadias with **opening of the urethra on the distal penile shaft**. Though not easily visible in this photograph, the urethral meatus is about midway between the normal location and the insertion into the scrotum. A **hooded foreskin**, which allows the glans to be readily visible, is present. The term **"natural circumcision"** sometimes used, is a misnomer. The foreskin is present,(just malformed).

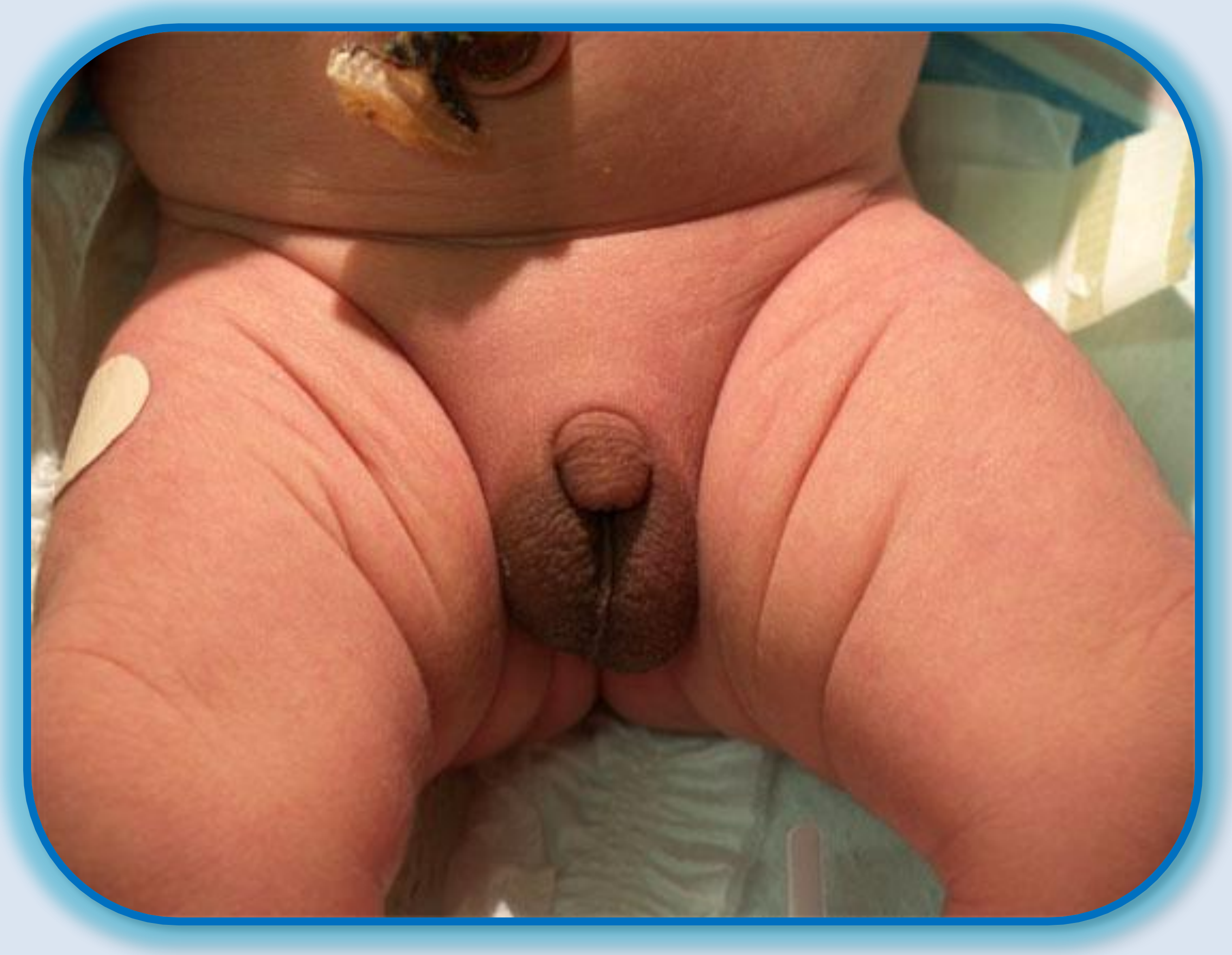
Hypospadias **affects 1:250 boys**, but most have a milder form than that shown here.

Hypospadias



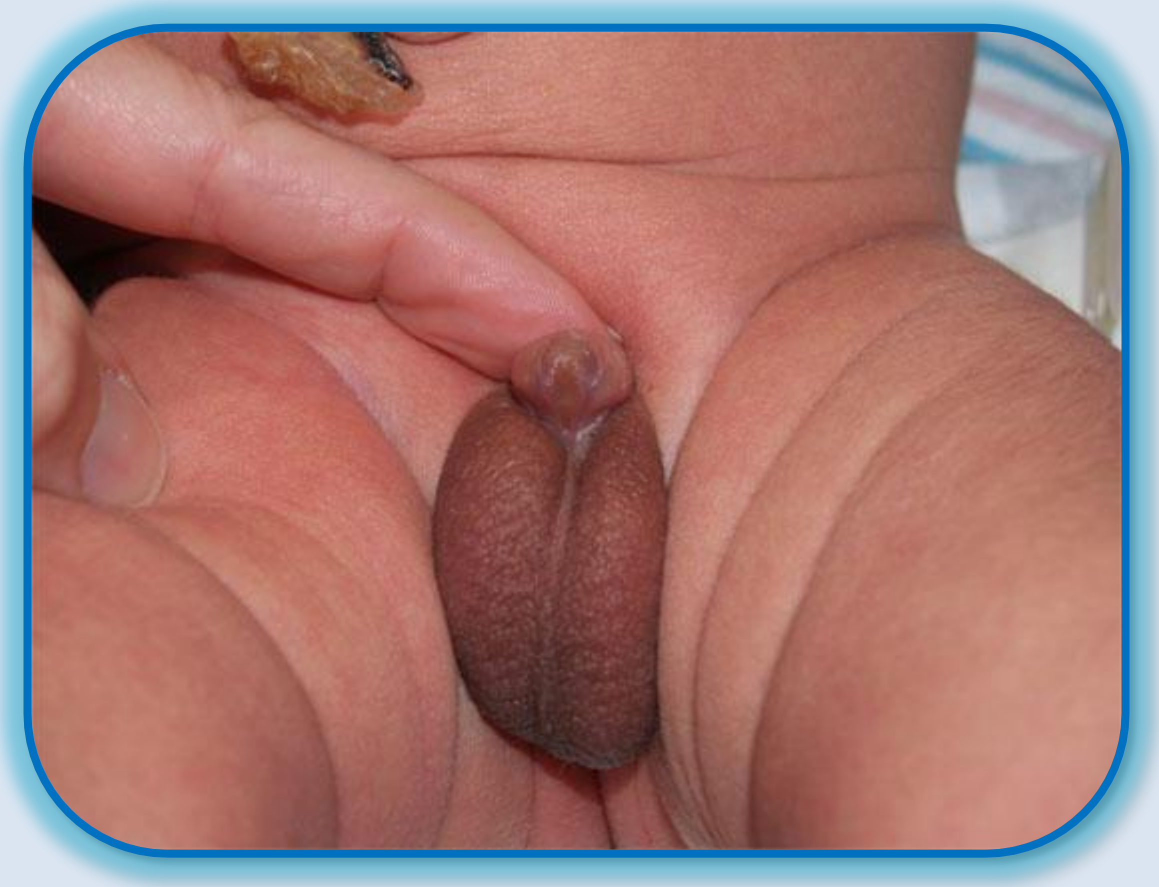
This is another example of hypospadias. Here, the **hooded foreskin** can be readily appreciated. The **urethral meatus** is visible in a slightly more **ventral position** than is normal. This is a **less severe degree** of hypospadias, **but still presents a contraindication to circumcision**.

Hypospadias



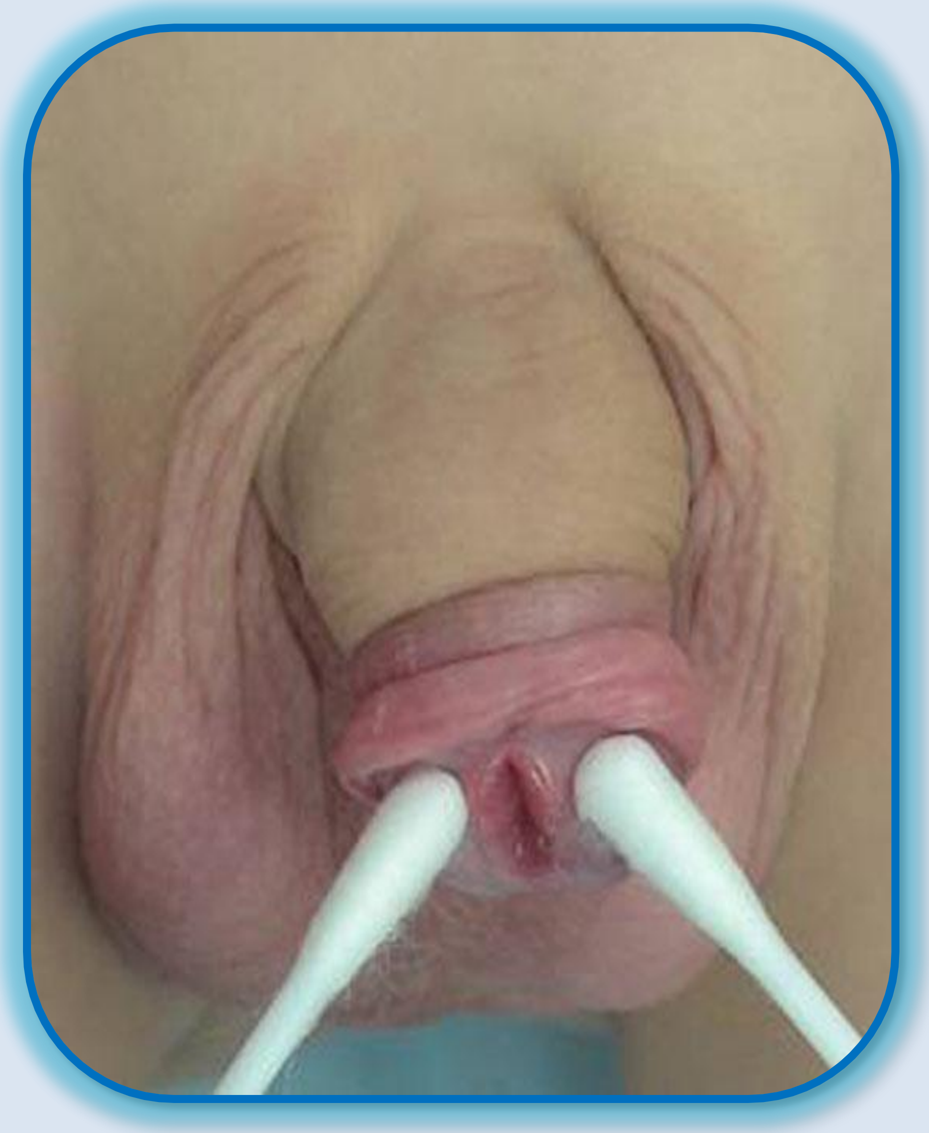
In this patient, hypospadias is not readily apparent at first look, although the phallus does appear somewhat short for a full-term infant. The following photo demonstrates the abnormality more clearly.

Hypospadias



Here, slight pressure was applied on the dorsal edge of the base of the penile shaft to tip the phallus up. With this view, one can see that the ventral surface of the shaft seems to be largely absent and that the urethral opening appears to lie in the very short distance between the scrotum and the foreskin bulges on the sides of the glans.

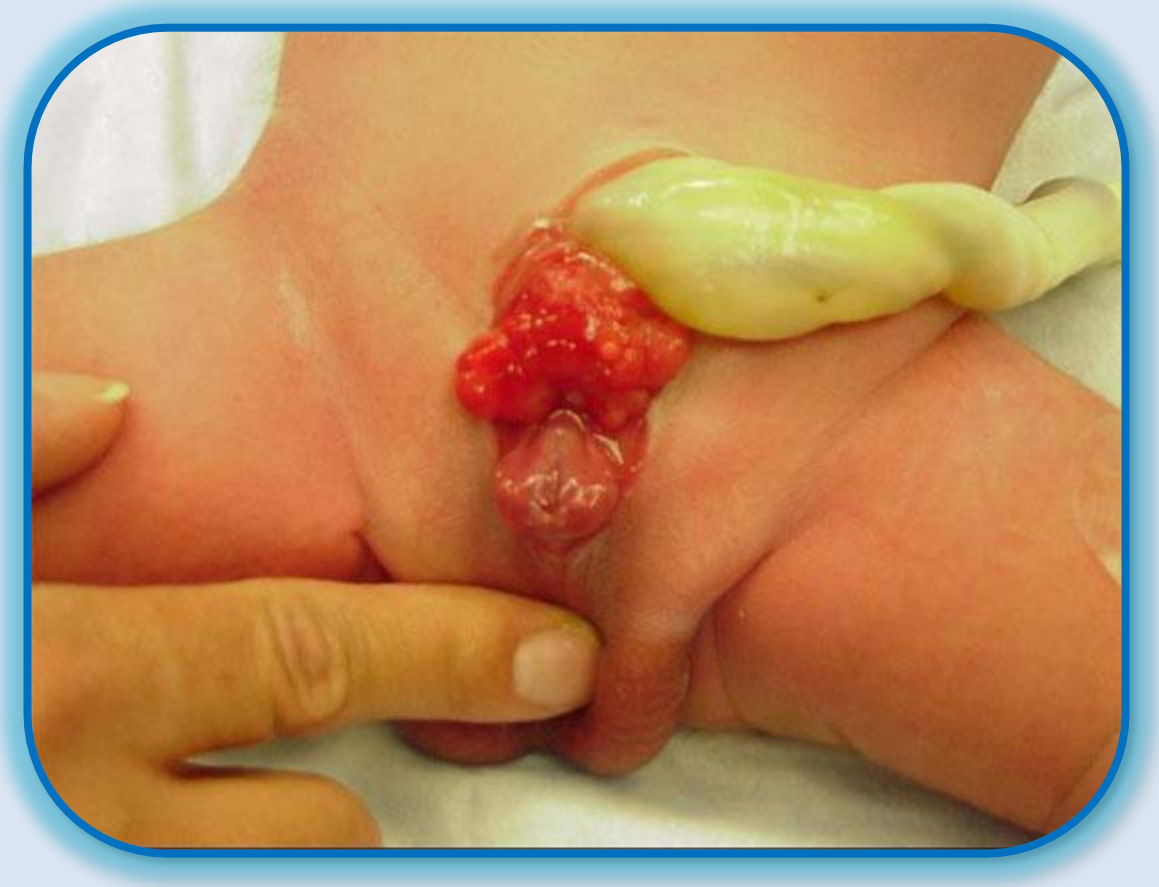
Epispadias



With epispadias, the **urethral meatus is** **dorsally** **displaced**. This condition is **much less common than hypospadias**, but **also presents a contraindication to routine circumcision**.

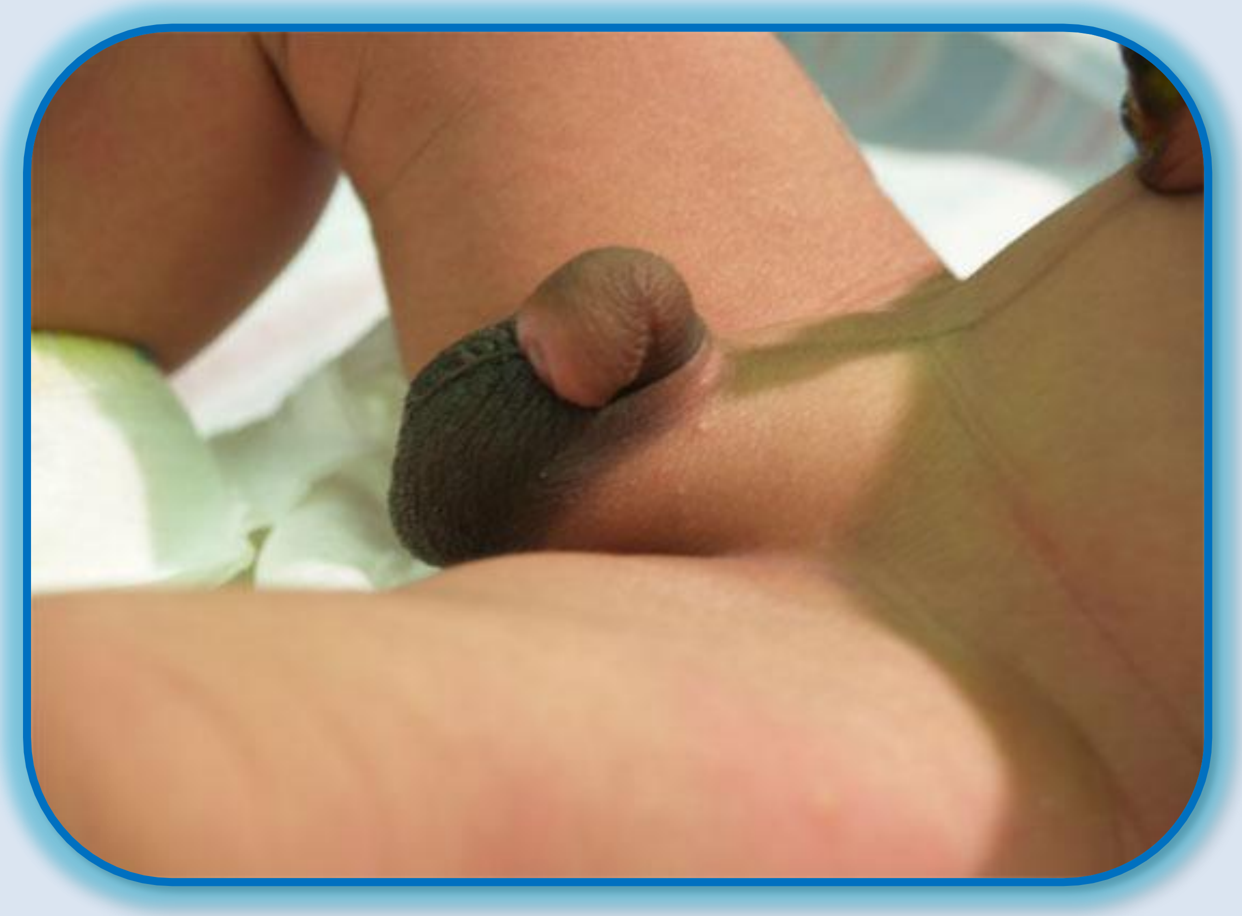
In its severe forms, epispadias is often associated with **exstrophy of the bladder**.

Epispadias



This is an example of **severe epispadias** and **bladder exstrophy**. The penis appears to be nearly completely splayed open lengthwise on the dorsal surface, and actually has a dorsal curvature which is minimized by the downward pressure applied to the scrotum. The red tissue inferior to the umbilical cord is the inner (posterior) wall of the bladder which is also splayed apart and protruding through a defect in the anterior pelvic wall. **Surgical correction is required**.

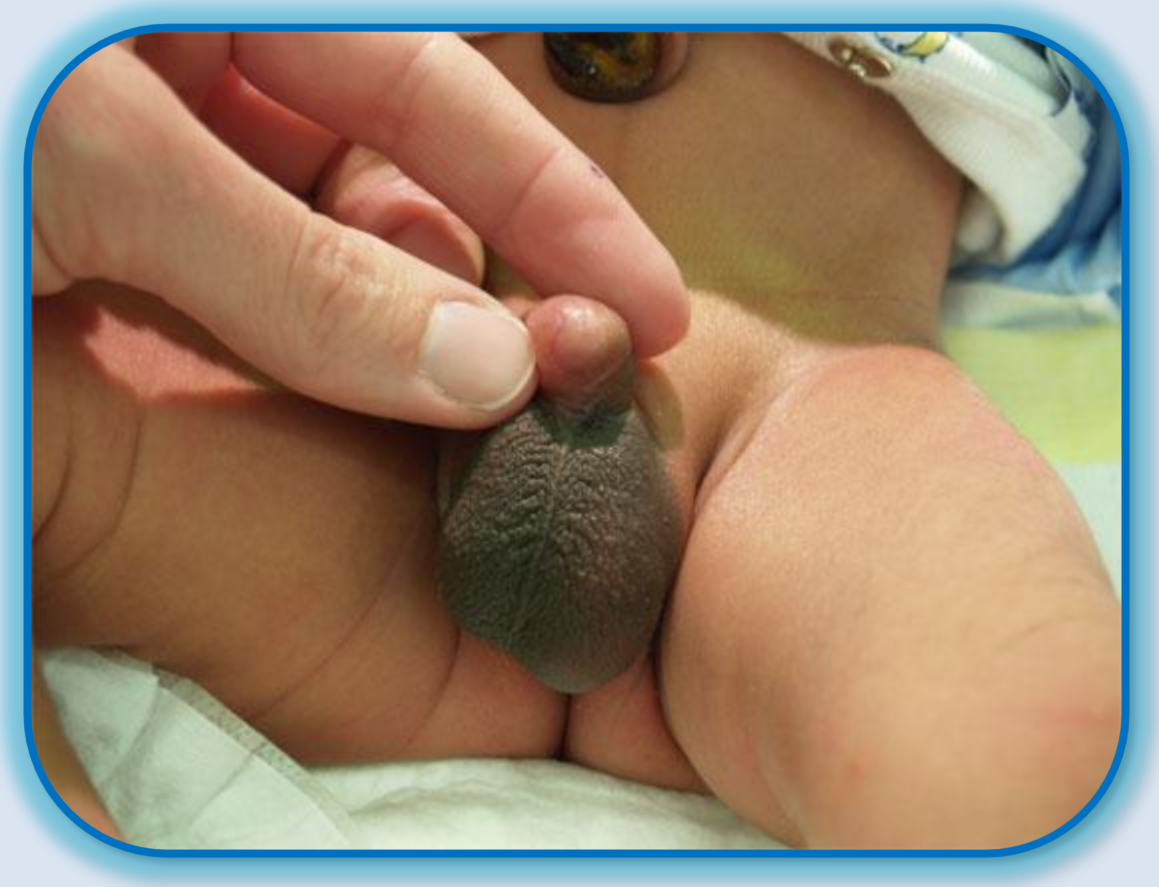
Chordee



Chordee exists when there is a **ventral curvature of the penis**. It can occur in the setting of hypospadias, but **can also be isolated**.

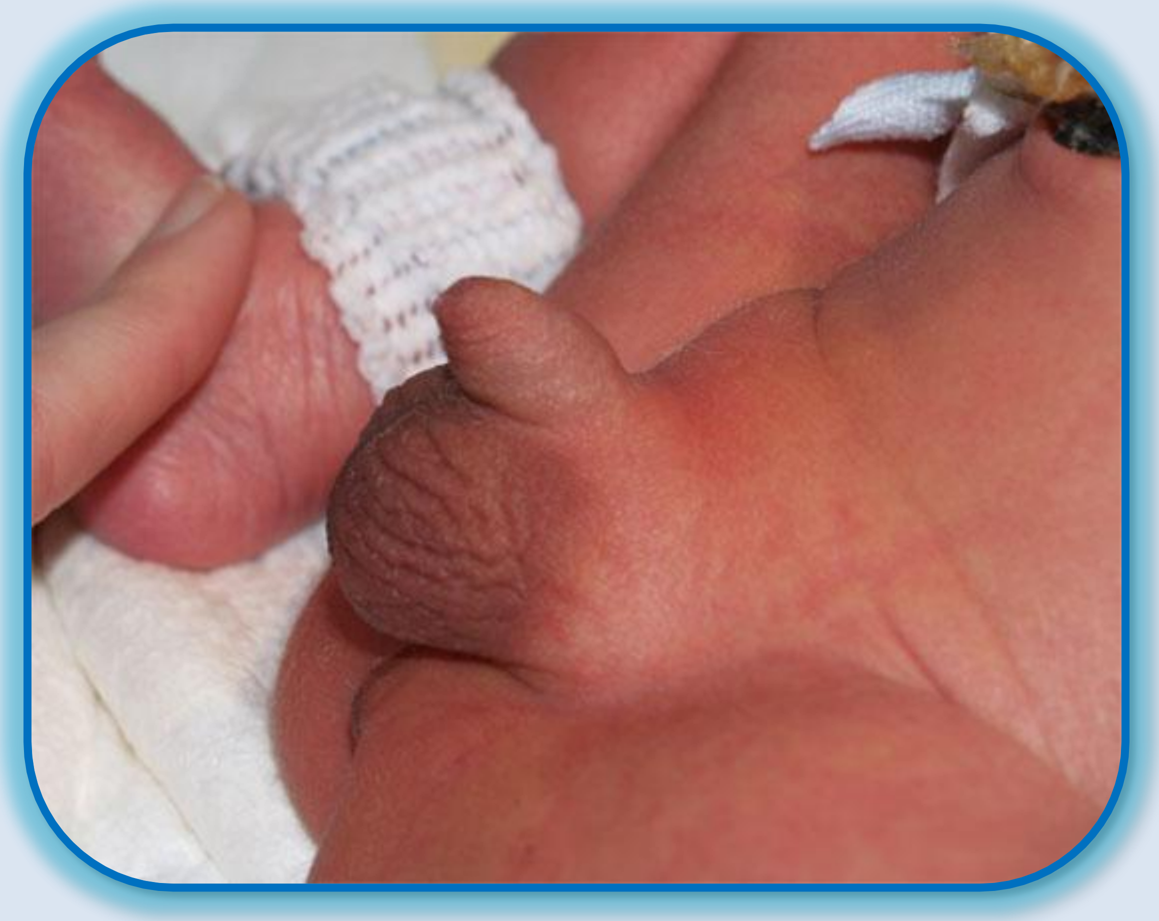
In this baby, the curvature is most visible from this view from the side. **Chordee is a contraindication to circumcision** in the newborn period, but if desired, circumcision **can be done at the time of surgical correction**.

Chordee



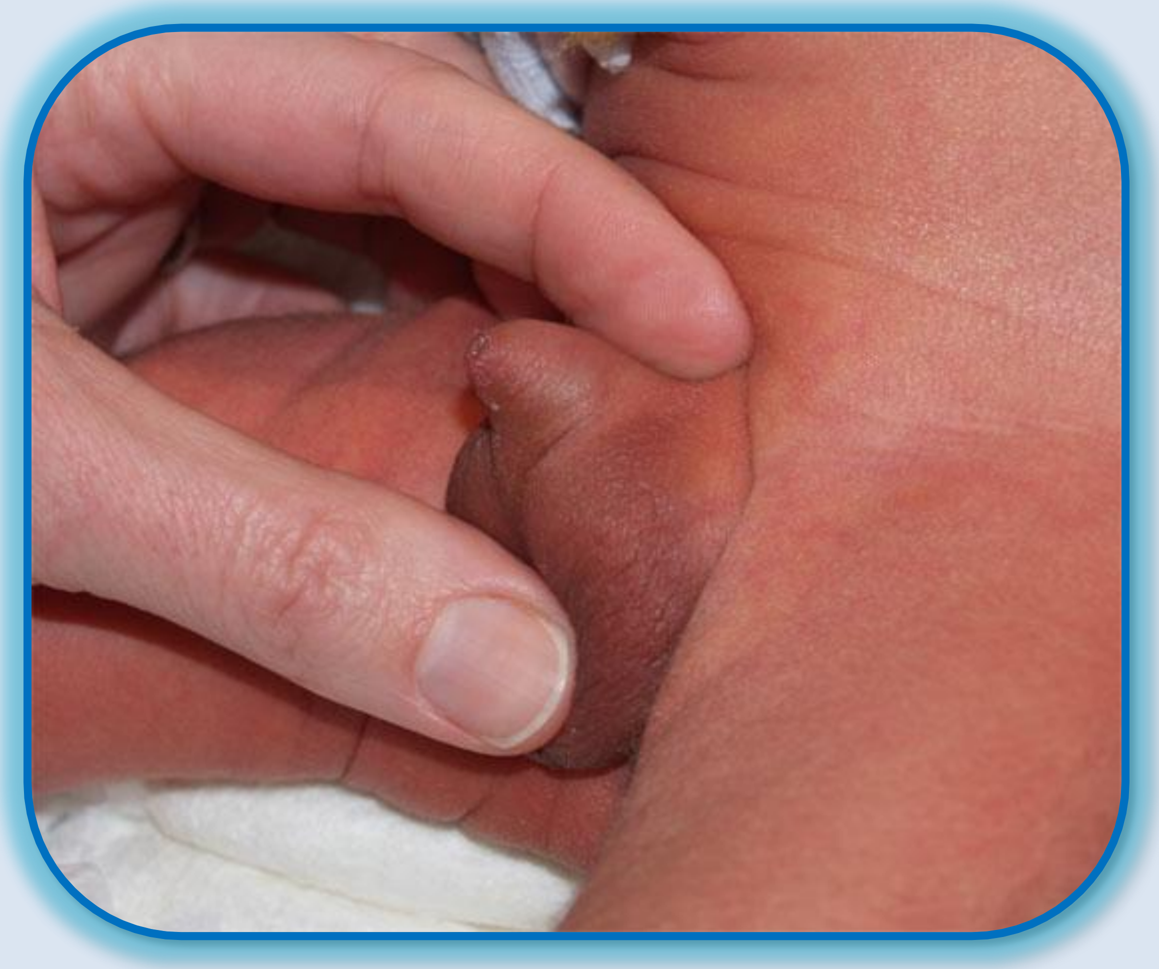
This is a frontal view of the same infant. The tip of the foreskin is not easily appreciated in the photograph, but on examination the foreskin and meatus appeared to be normal. Curvature of the shaft is the only abnormality in this case.

Webbed Penis



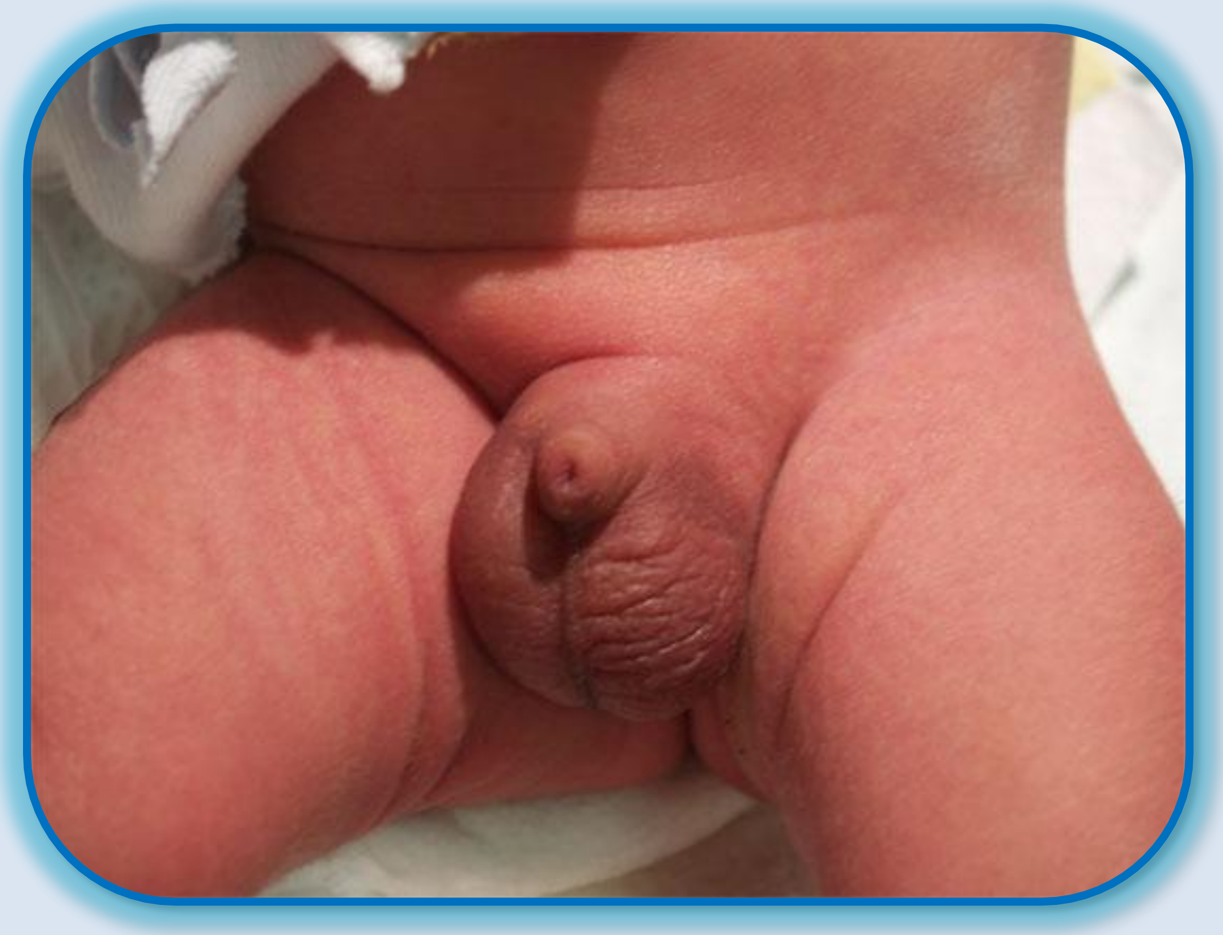
When present, a penoscrotal web (webbed penis) is **another contraindication to routine circumcision**. On cursory examination, the penis in this child appears to be within normal limits; however, there was very little skin surface between the tip of the foreskin and the scrotum. The following photo shows the abnormality more clearly.

Webbed Penis



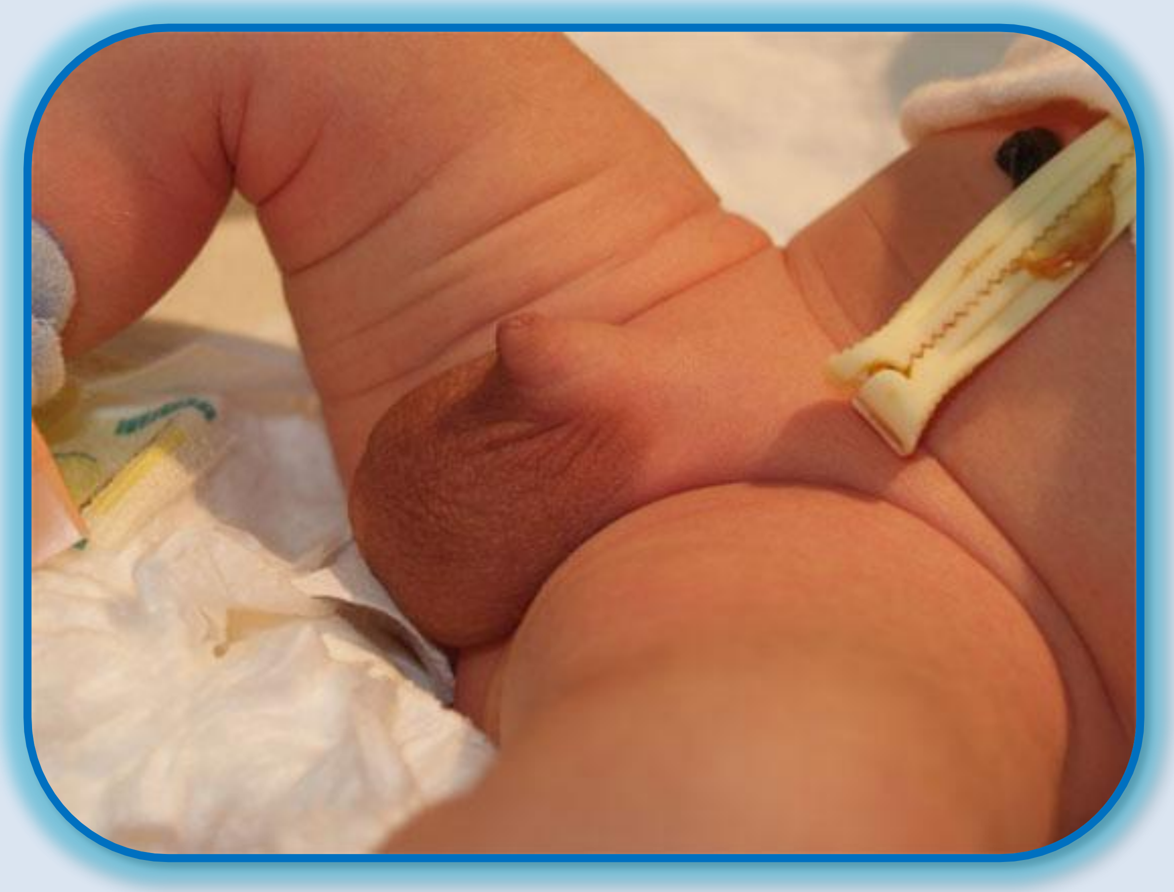
When traction is applied to the skin at the base of the penis, the web can more clearly be seen. **Routine circumcision is contraindicated** in this case as **it may lead to the penis becoming trapped behind a scarred, tent-like fold of skin**.

Buried Penis



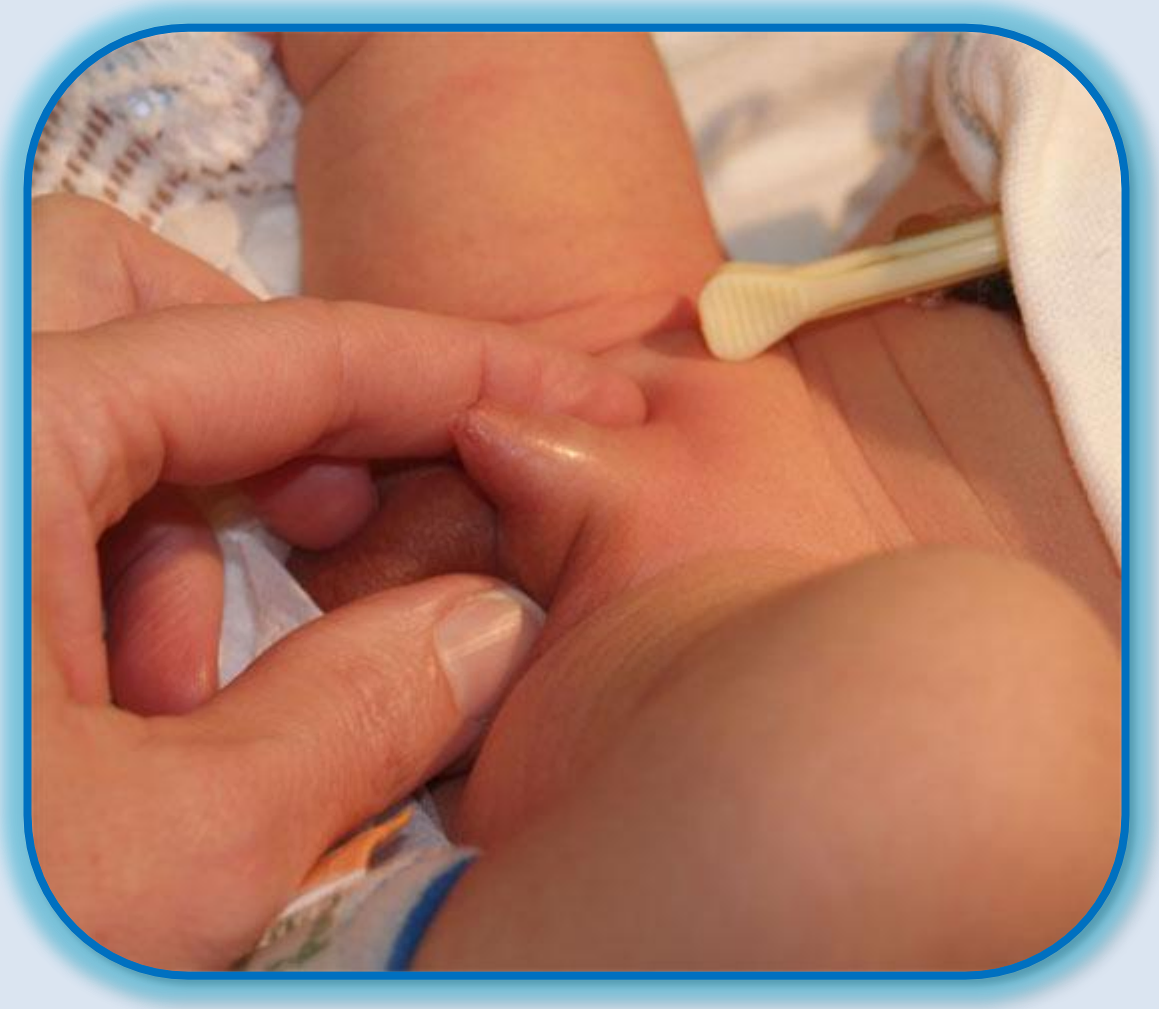
In some infants, the penis appears to be **"buried"** in the tissues surrounding it. This is another **contraindication to routine circumcision**, as it could result in the penis becoming **trapped** underneath the healing circumcision site and result in an overall worsening of the condition.

Buried Penis



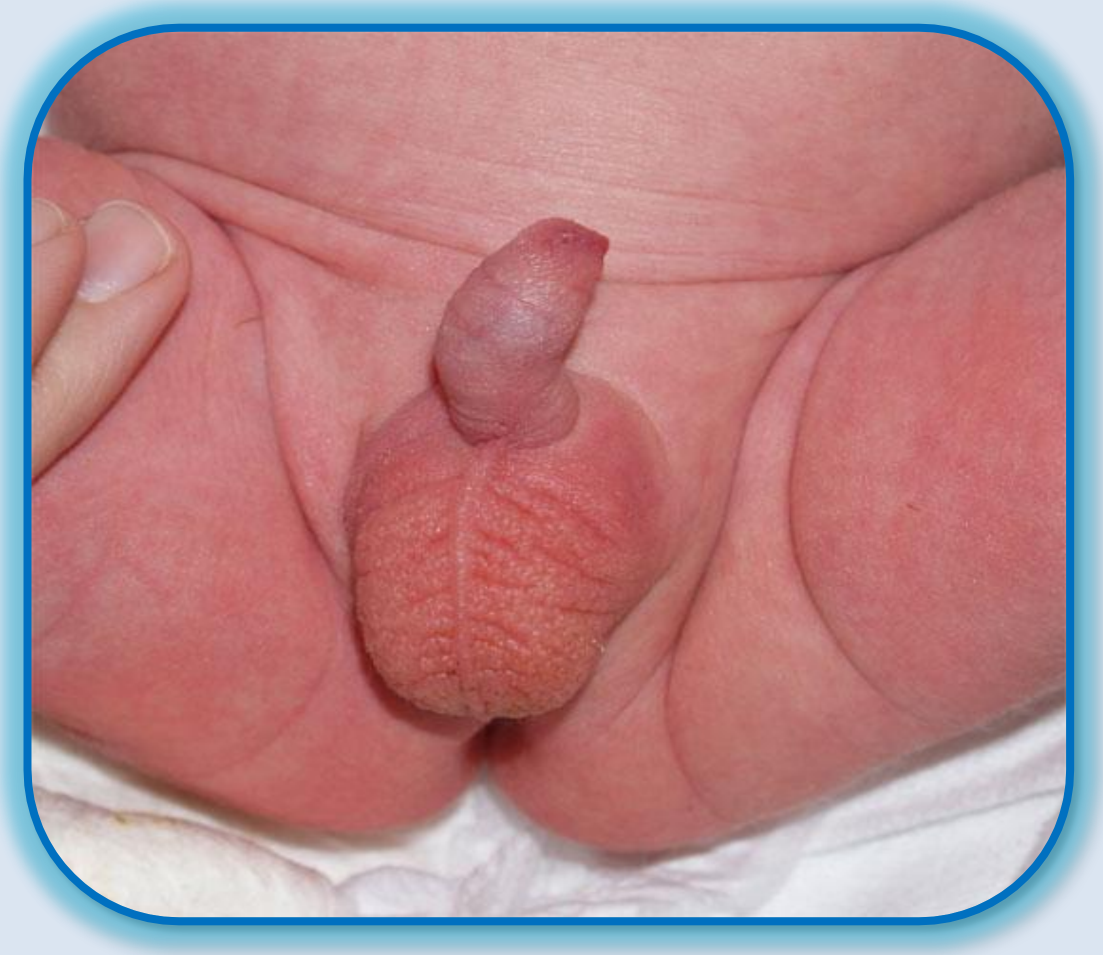
Here is another example of a newborn with a **buried (concealed) penis**. With this view, the **ventral foreskin looks unusually short and the shaft of the penis is not readily visible**.

Buried Penis



When downward pressure is applied beside the penile shaft, more of the underlying normal anatomy can be seen. However, because of the tendency of the penis to retract back into its previous position and because of the relatively small amount of foreskin present, this is still a **contraindication to routine neonatal circumcision**.

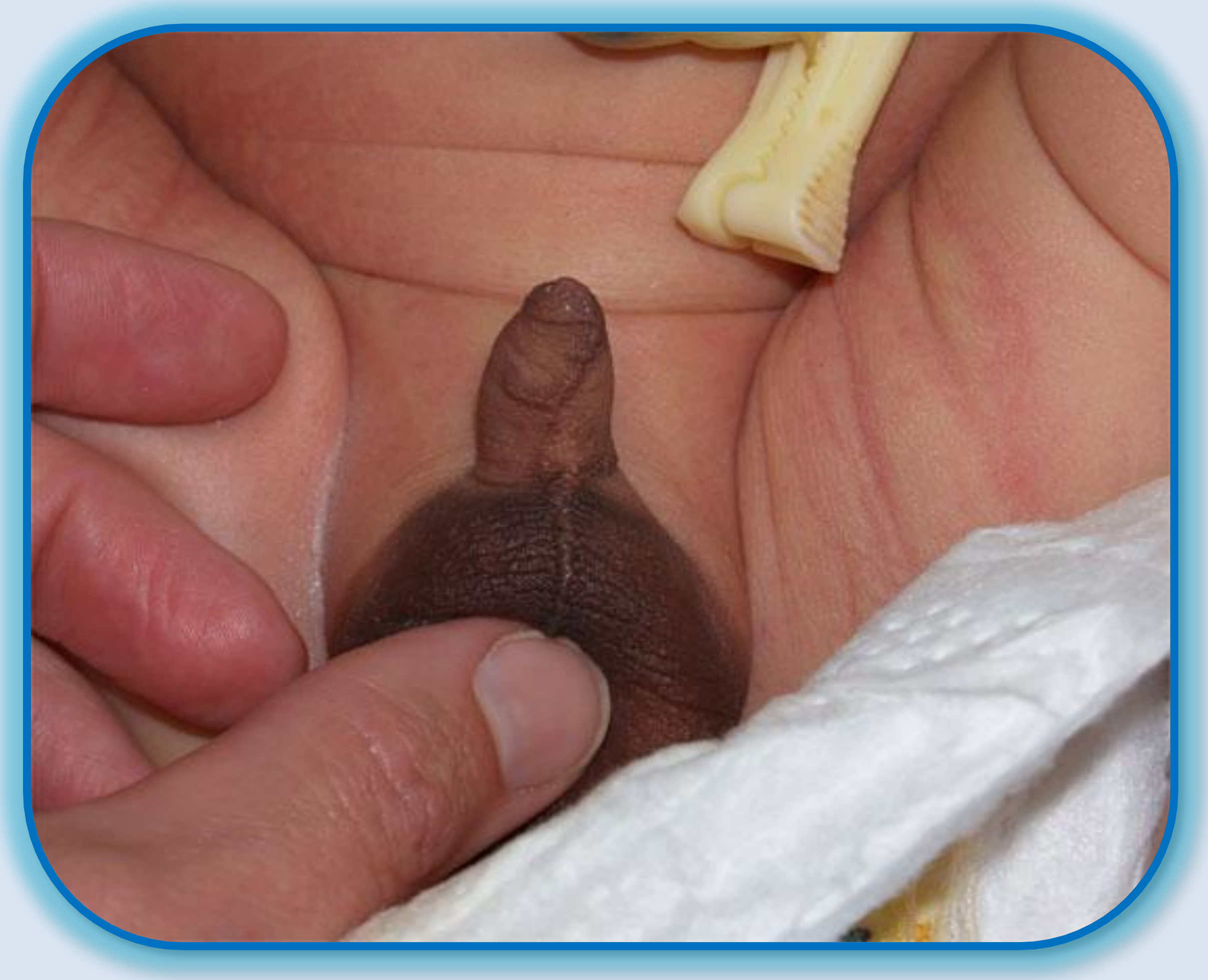
Penile Torsion



This is an example of penile torsion of about 90 degrees. A mild degree of torsion (<60 degrees) is felt to be a variation of normal and is not a contraindication for circumcision.

In this case, **circumcision was postponed until the time of surgical correction at about 4 months of age**. Penile torsion **does not cause functional impairment** in newborns, but **high degrees of torsion should be corrected** (with or without circumcision) **to prevent painful or dysfunctional erections in later life**.

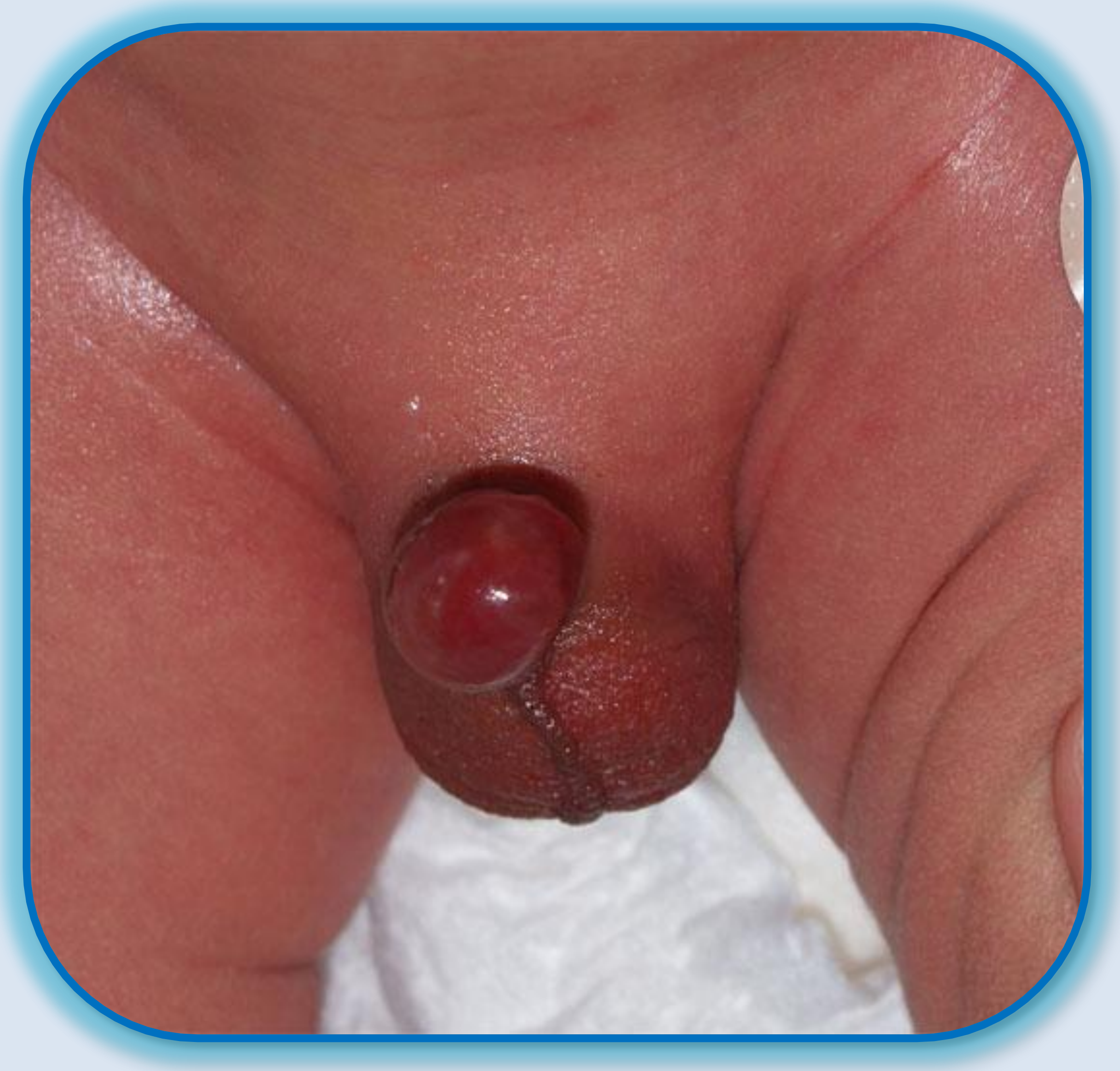
Penile Torsion



Another **clue** to a possible penile torsion is the **rotated appearance of the median raphe**.

Here, the raphe starts in the midline at the scrotum, but then **winds around the shaft** to the left and ends up on the left side at tip.

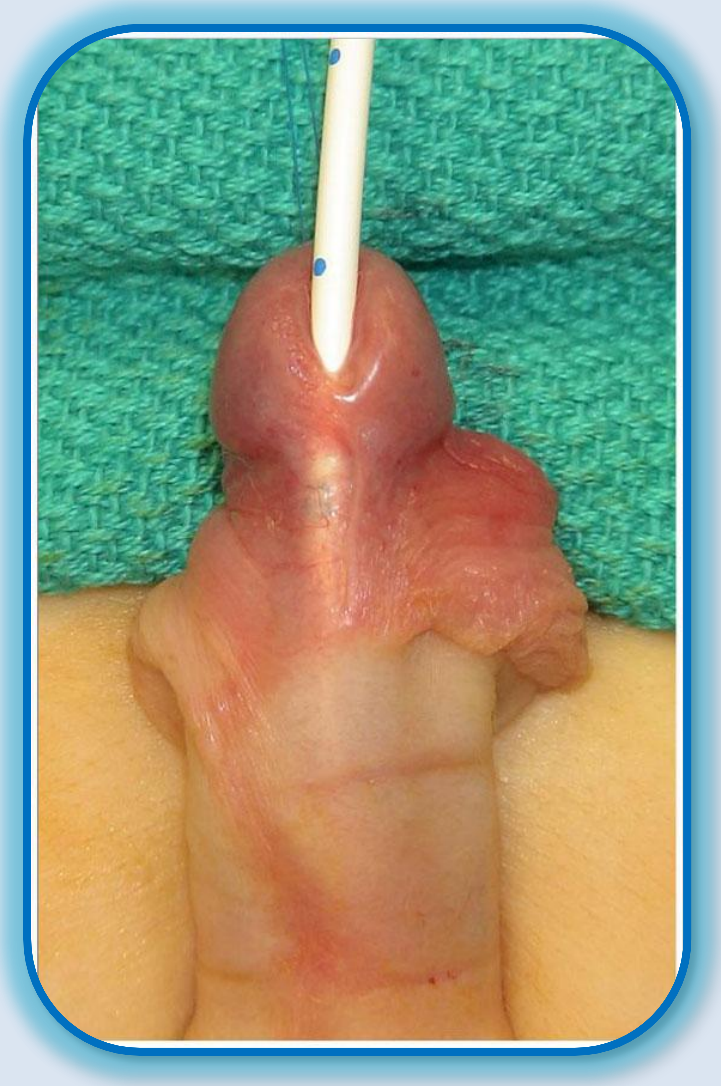
Penile Torsion



Because circumcision was desired and penile torsion was suspected, a urology consult was obtained before this procedure. All agreed that the likely torsion was about 45 degrees and that circumcision could safely be done.

Here the counterclockwise rotation of the urethral meatus can be seen in relation to the midline of the scrotum.

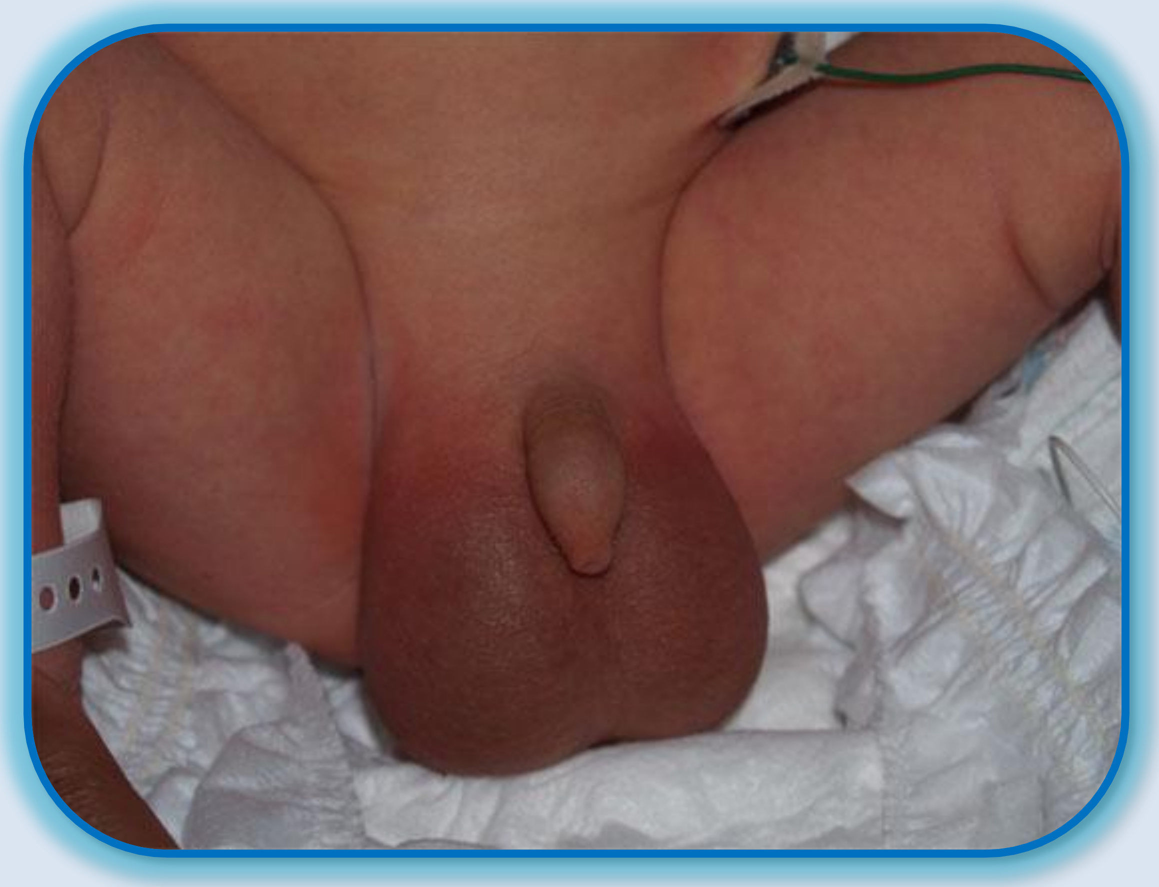
Hypoplastic Urethra



When examining the penis, assessment of the adequacy of skin circumferentially should be made. If the ventral side seems deficient, urethral hypoplasia may exist. Patients with this condition often have a penile raphe that zigzags back and forth as well as a **thinned or shortened foreskin on the ventral side**.

Circumcision is absolutely contraindicated, and a pediatric urologist should be consulted.

Hydrocele

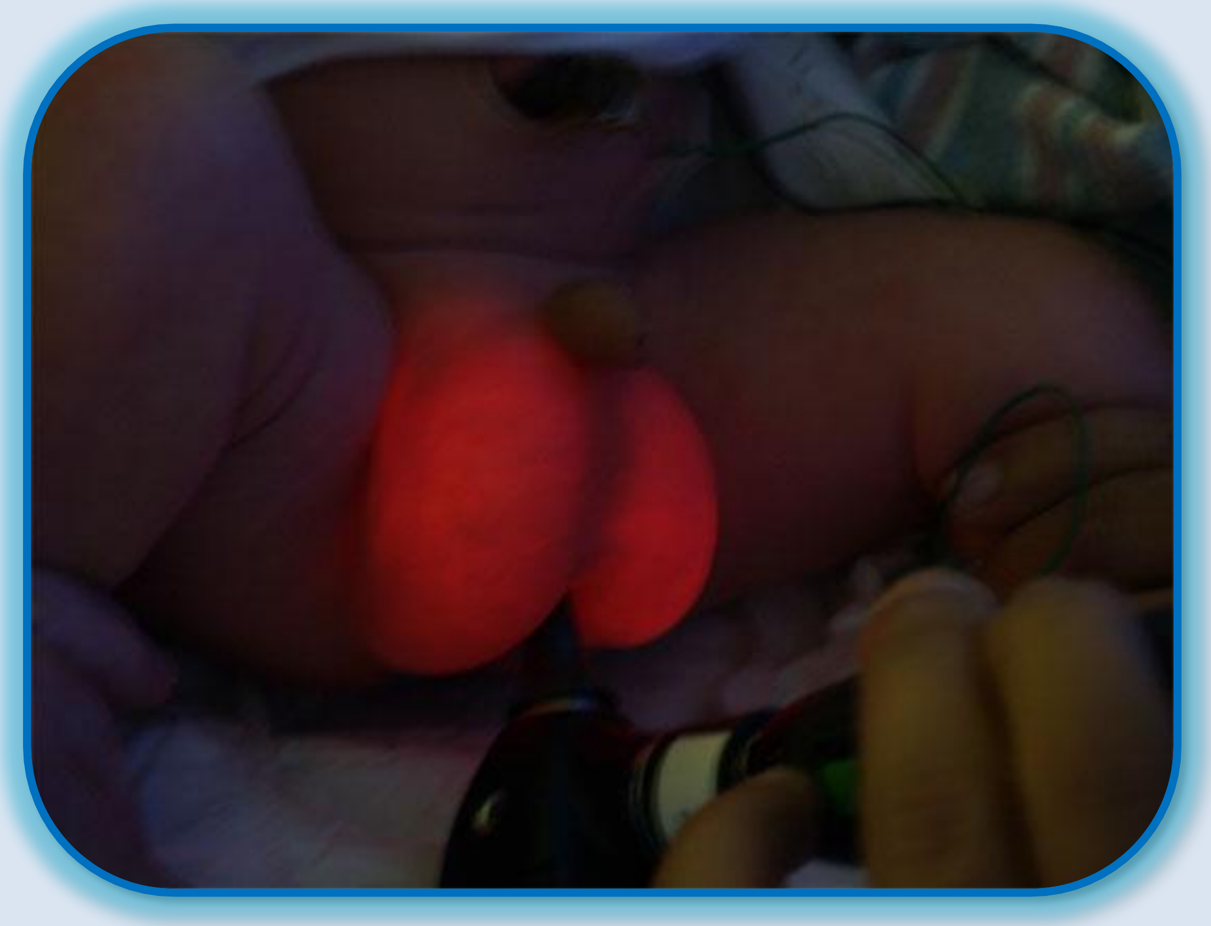


Hydroceles are a frequent finding in newborns.

It is important on **palpation** to identify the normally **small testicles** (approximately 1 cm) as separate entities from the large, smooth-walled fluid collections of hydroceles.

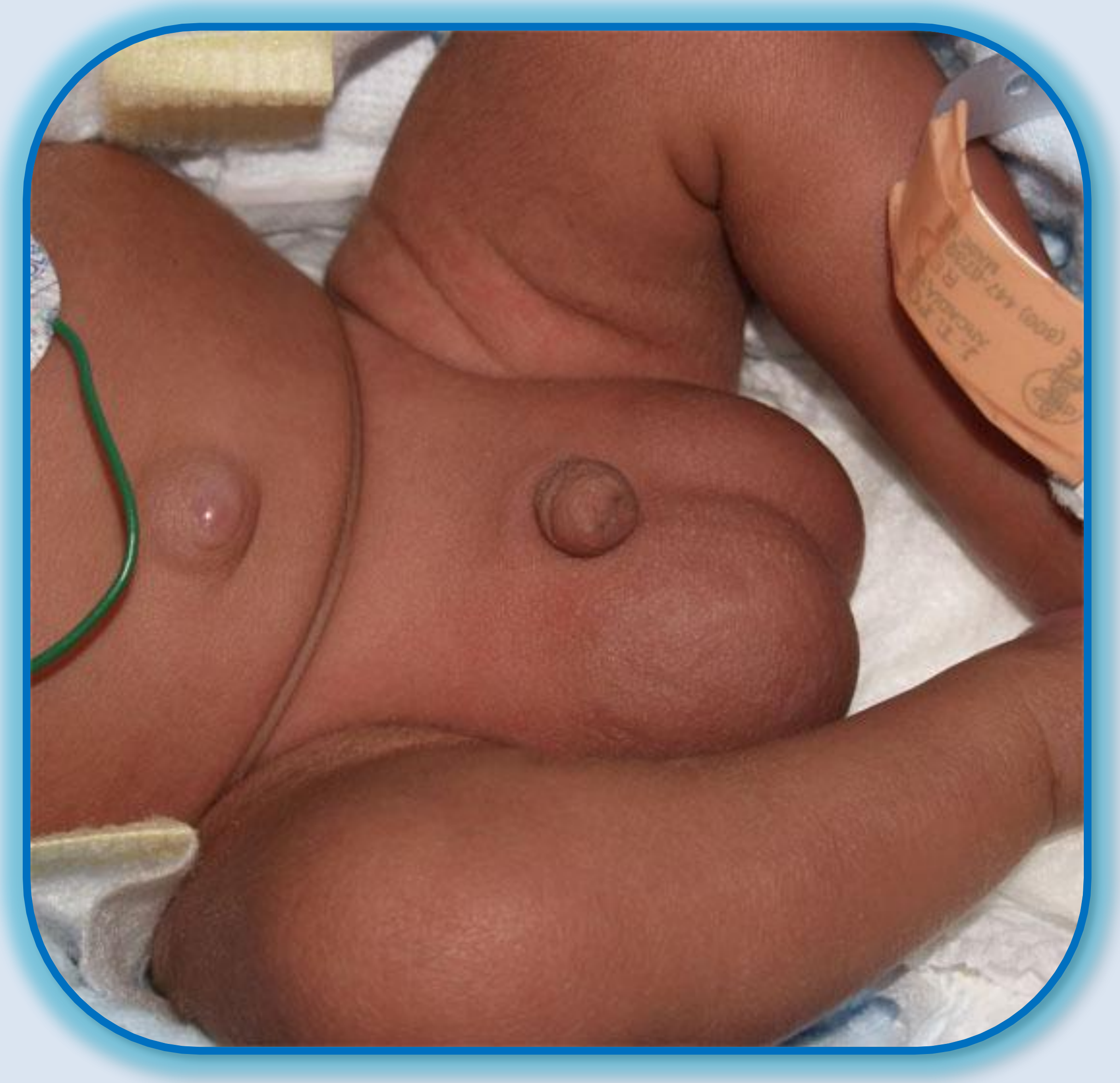
In contrast to inguinal hernias, common (non-communicating) hydroceles cannot be reduced as the fluid is in an enclosed space. Spontaneous resolution is expected.

Hydrocele



Here one can see how easily the fluid-filled hydroceles transilluminate. **Transillumination** may be used to assist in making a diagnosis but for an experienced examiner, the diagnosis is usually made by palpation alone.

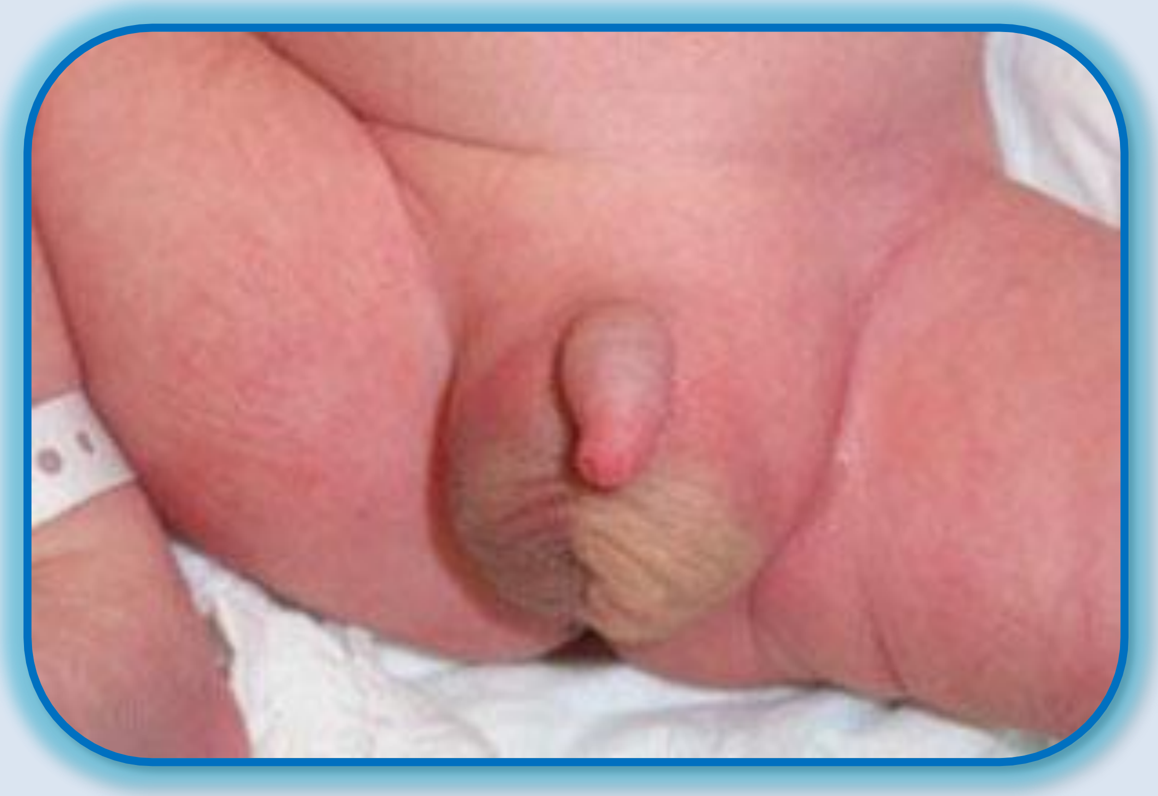
Inguinal Hernia



This is a typical appearance of **bilateral** inguinal hernias.

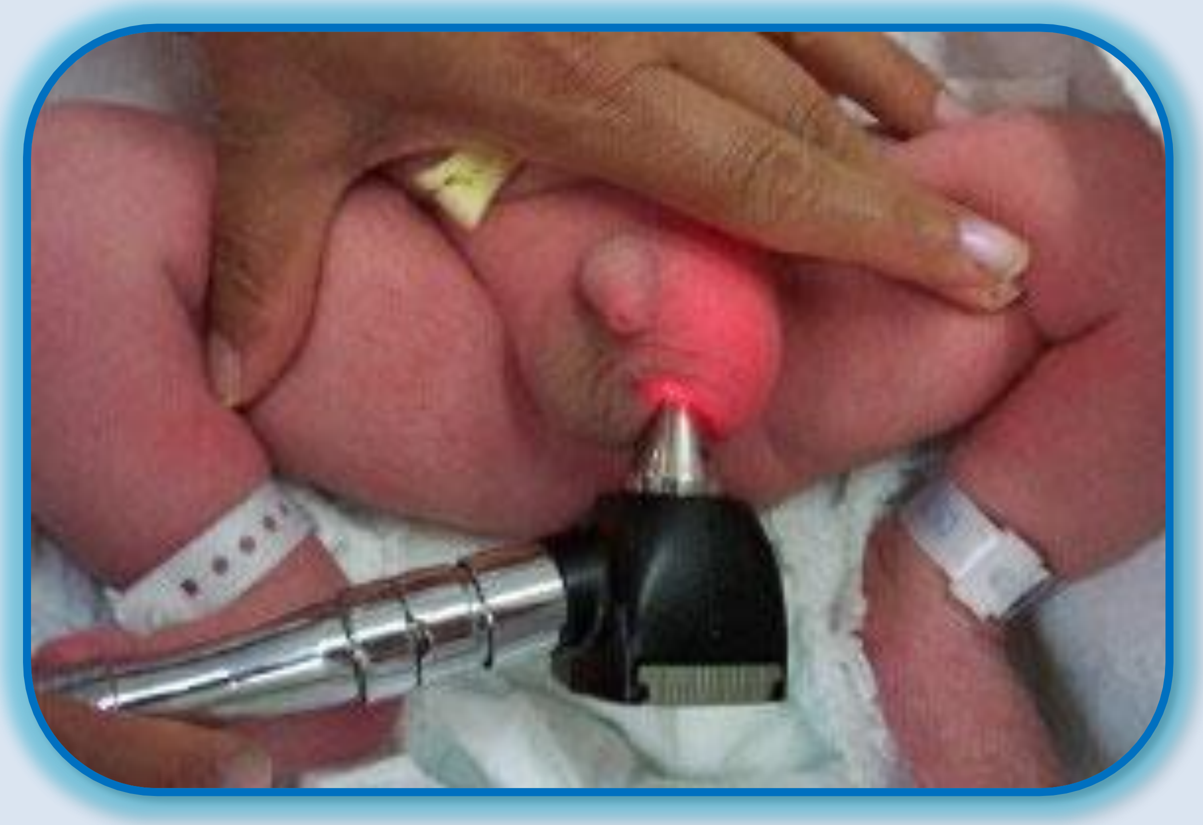
In contrast to hydrocele, inguinal hernias are typically associated with a **fullness in the inguinal area**. This infant is **preterm**, a risk factor for the presence of hernias. While the scrotum may transilluminate with hernias, the masses can frequently be reduced with digital pressure. At times **bowel sounds** may also be appreciated over the area of the mass.

Acute Testicular Torsion



This otherwise well infant presented with **acute color change of the scrotum**. The right testicle was torsed and the baby was taken emergently to surgery.

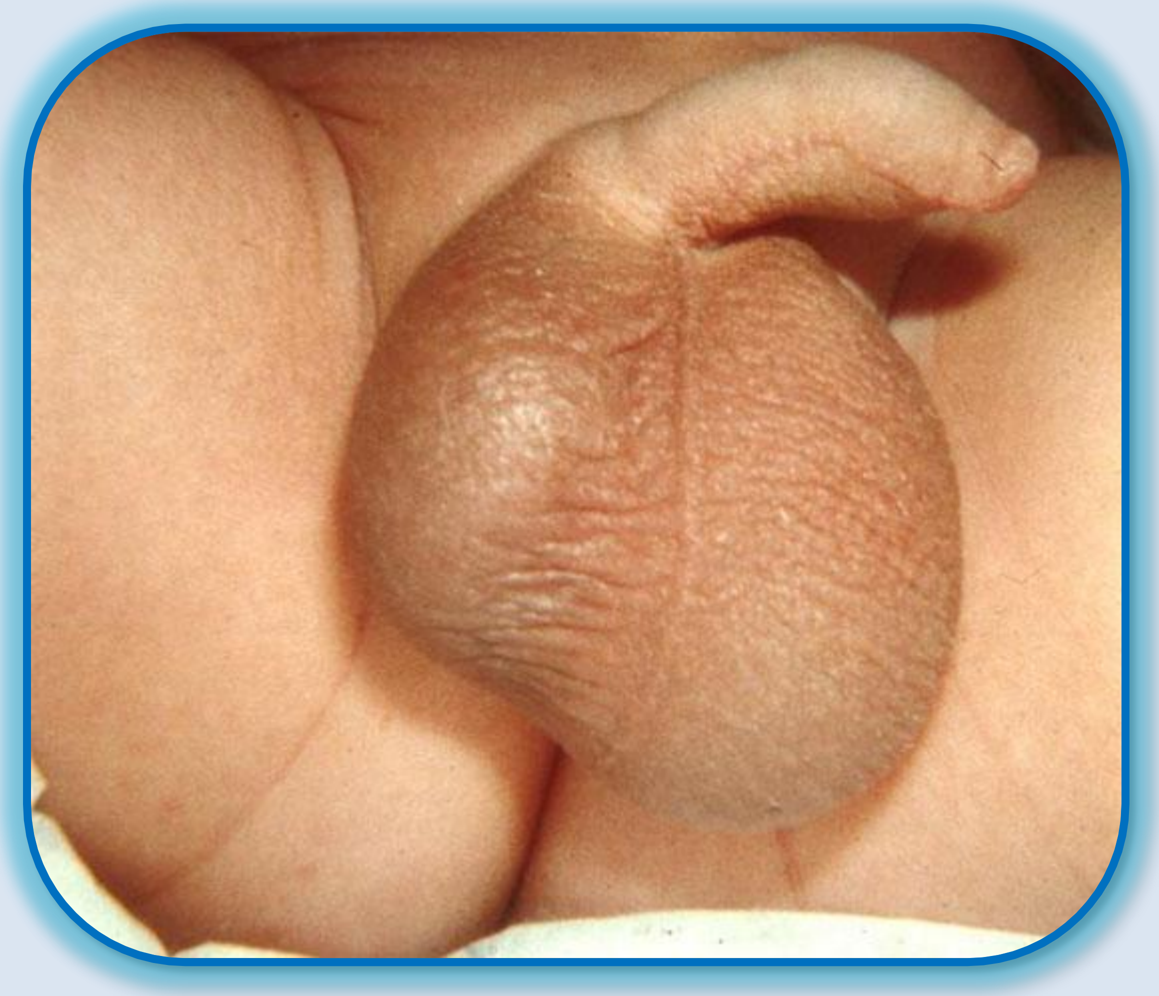
Acute Testicular Torsion



The same infant as in the previous photo.

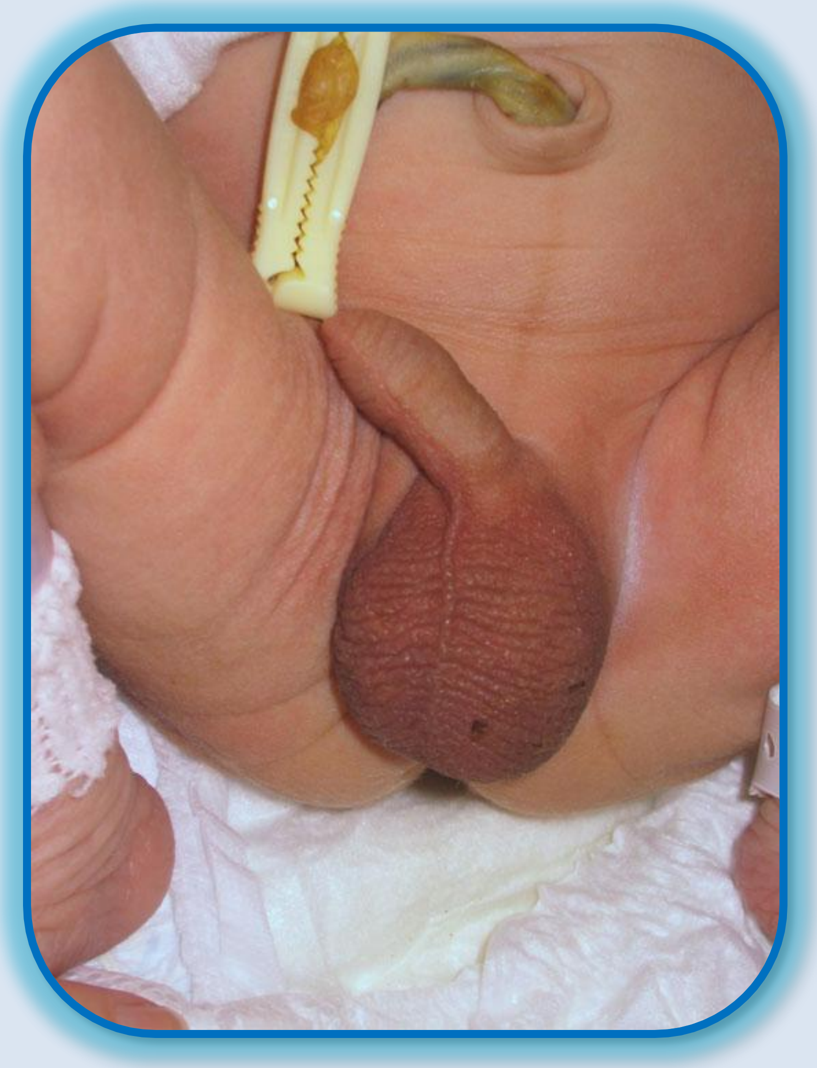
Because of the pathology in the right testicle, the right scrotum does not transilluminate equally with the left.

Testicular Torsion



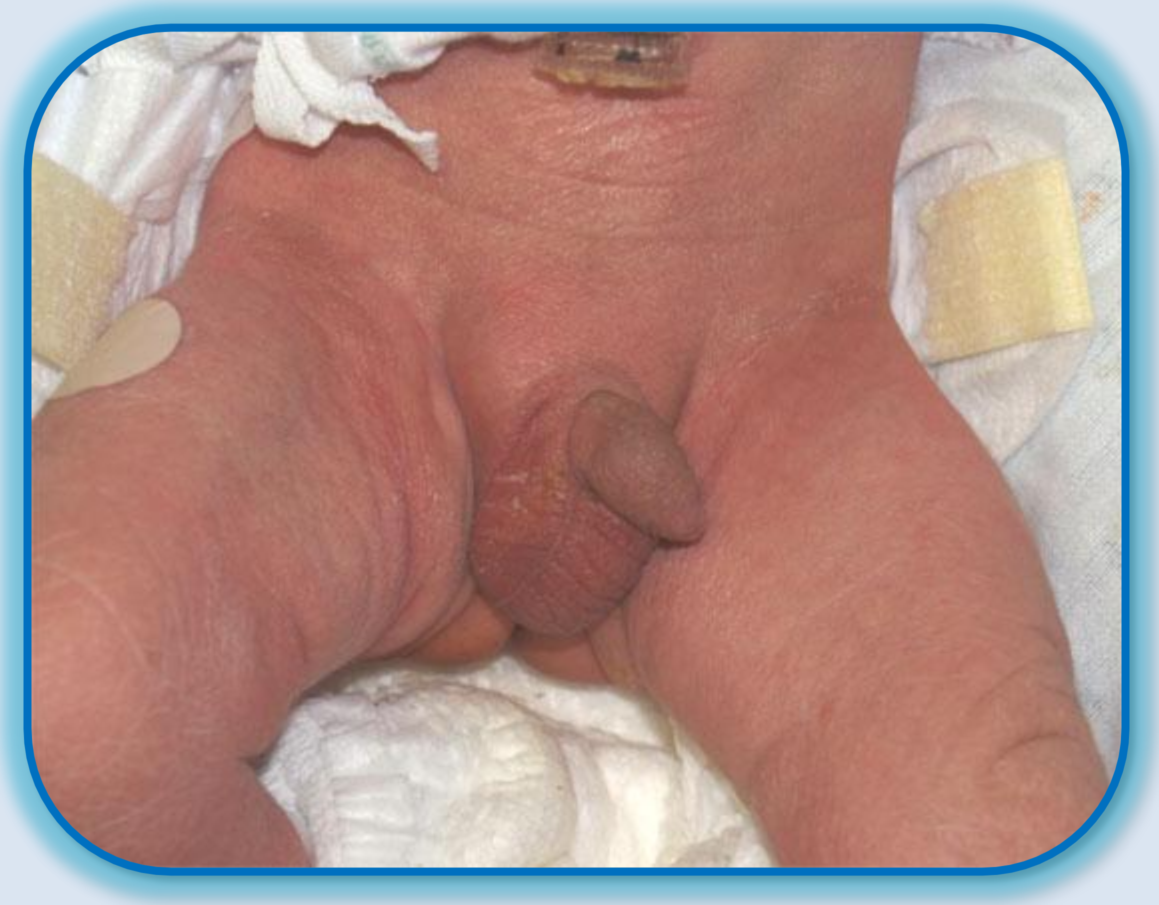
This is another example of testicular torsion in the newborn. Here, the discoloration is more subtle, but the difference in size between the two halves of the scrotum is striking. The testicle on the baby's right side is the affected one.

In Utero Testicular Torsion



With antenatal torsion, the scrotum typically has a normal appearance. On examination, however, the right testicle was slightly larger and more mass-like in texture than the normal left testicle. Ultrasound with **Doppler** confirmed that there was no **blood flow** to the right side. This infant was taken to the OR on day 2 for **removal** of the right testicle and **fixation** of the left testicle as the contralateral side is also at **increased risk of torsion**.

Descending Testicle

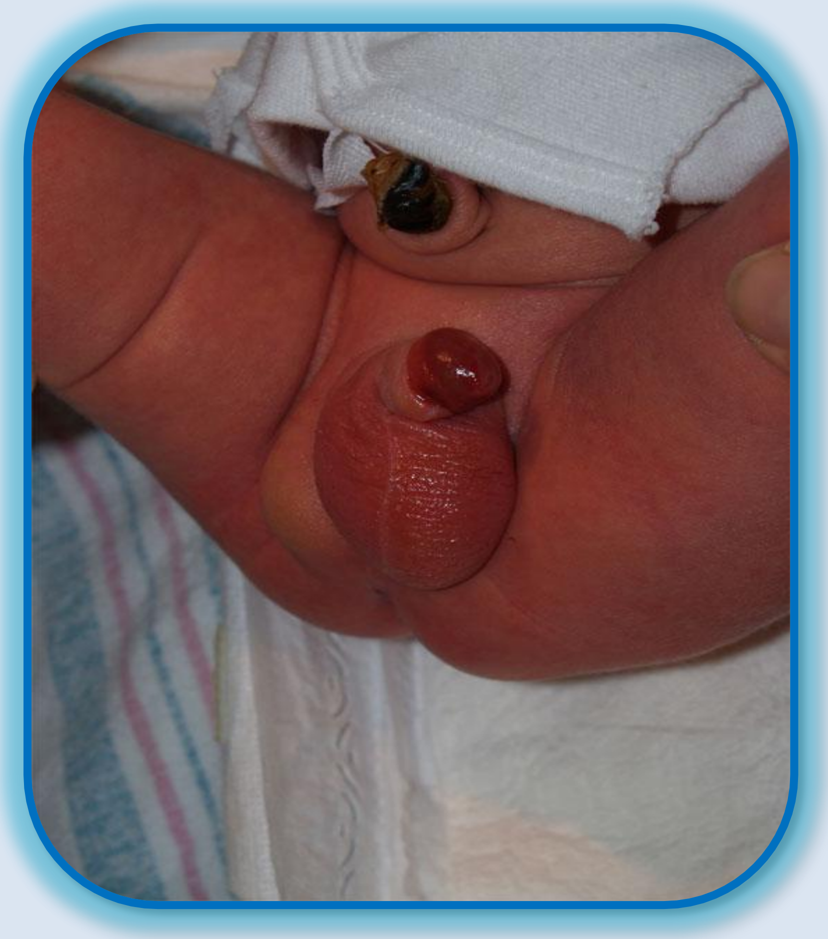


In a term infant, the testicles have normally completed their **migration** from the abdomen into the scrotum. However, even term infants will at times have one testicle that is undescended or incompletely descended.

In this infant, the right side of the scrotum was **empty** and the **testicle was palpated in the inguinal canal** (seen as a bulge).

Because this testicle is located along the **normal pathway** of descent and is **not ectopic**, no further evaluation is needed. **Spontaneous descent** into the scrotum is expected with time.

Ectopic Testicle

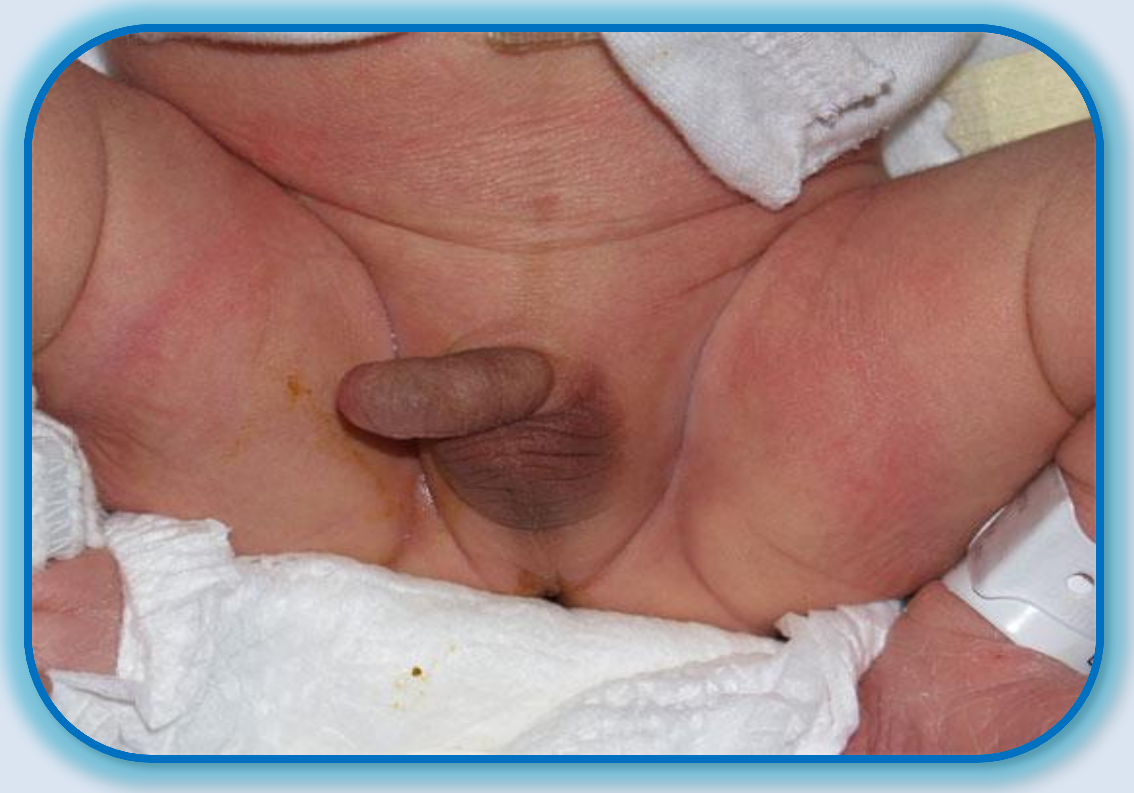


During descent, it is possible for the testicle to pass through the inguinal ring and then veer off course into an aberrant location.

On examination of this infant, the **right testicle was absent** from the scrotum, but a mass was appreciated over the perineum. **Ultrasound confirmed the diagnosis** of ectopic testicle.

Ectopic testicles may be found in the superficial inguinal pouch, the suprapubic area, the perineum, the femoral canal, or even the other side of the scrotum.

Undescended Testicles



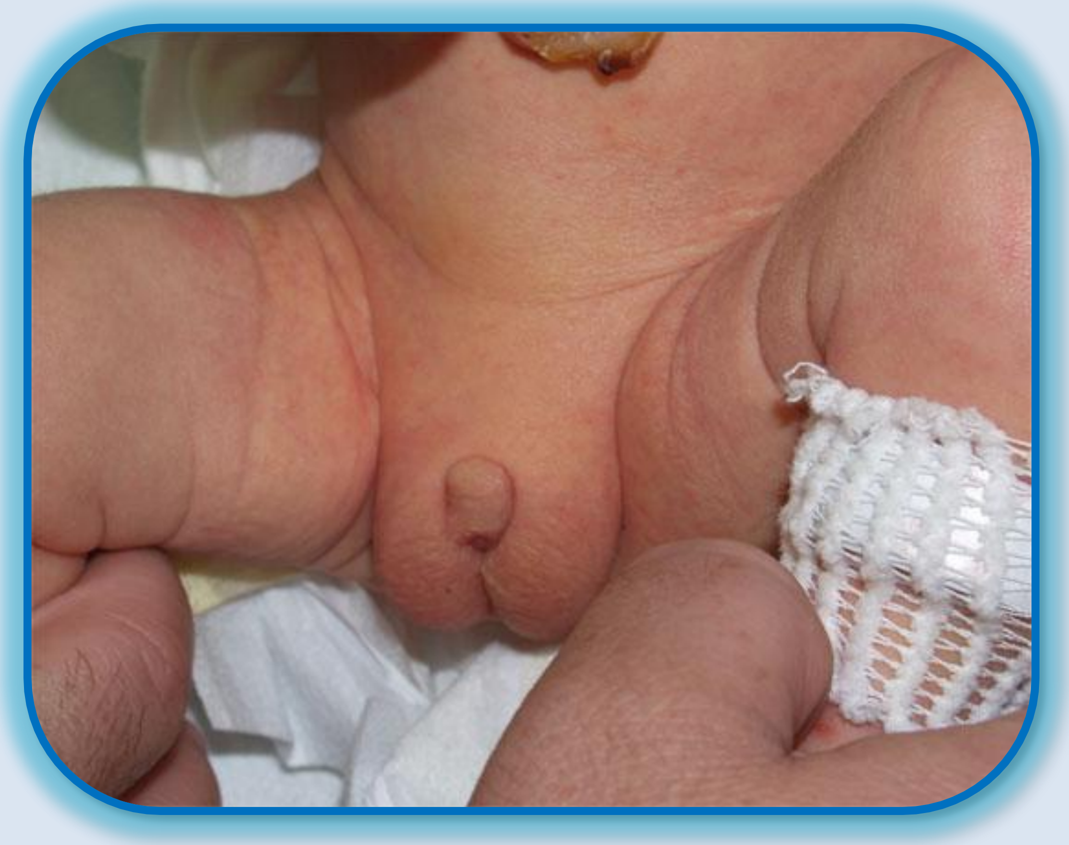
At times, the testicles are not palpable at all in the scrotum. In the photo above, the scrotum appears mature, but quite flat.

Unilateral undescended testicle is fairly **frequently** encountered in term newborns and **does not** require further evaluation at birth.

Bilateral undescended testicles, however, are quite unusual at term and should be considered as ambiguous genitalia until proven otherwise.

As a first step, **ultrasound** can be used to assess the presence or absence of Mullerian structures internally or may identify testicles in the inguinal canal that were not appreciated on exam. In this infant, testicles were identified in the lower abdomen.

Ambiguous Genitalia



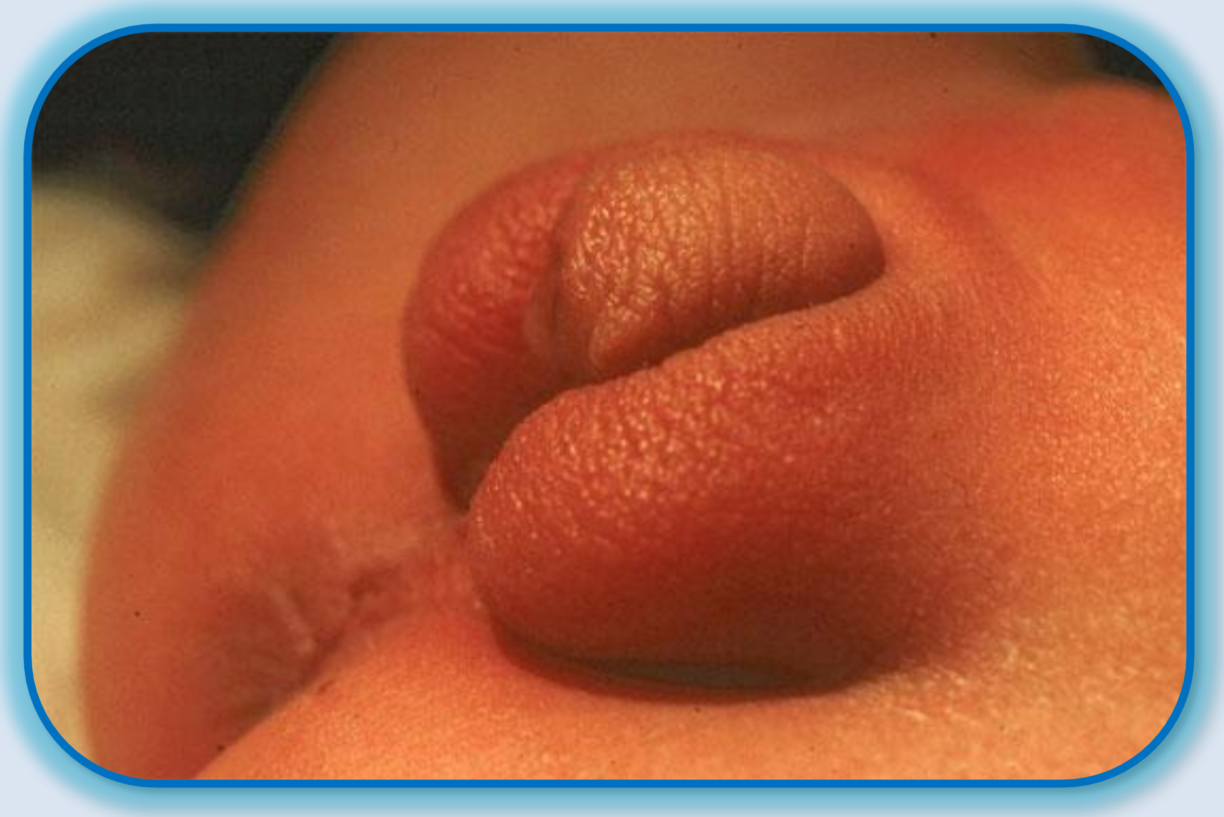
In any case where the genitalia are ambiguous, a work-up to determine gender and the underlying cause of the ambiguity should begin immediately.

These infants should be initially observed in the NICU so that any electrolyte abnormalities can be identified and treated rapidly, and appropriate specialists involved (e.g. endocrine, genetics, urology).

Circumcision is absolutely contraindicated when genital ambiguity exists.

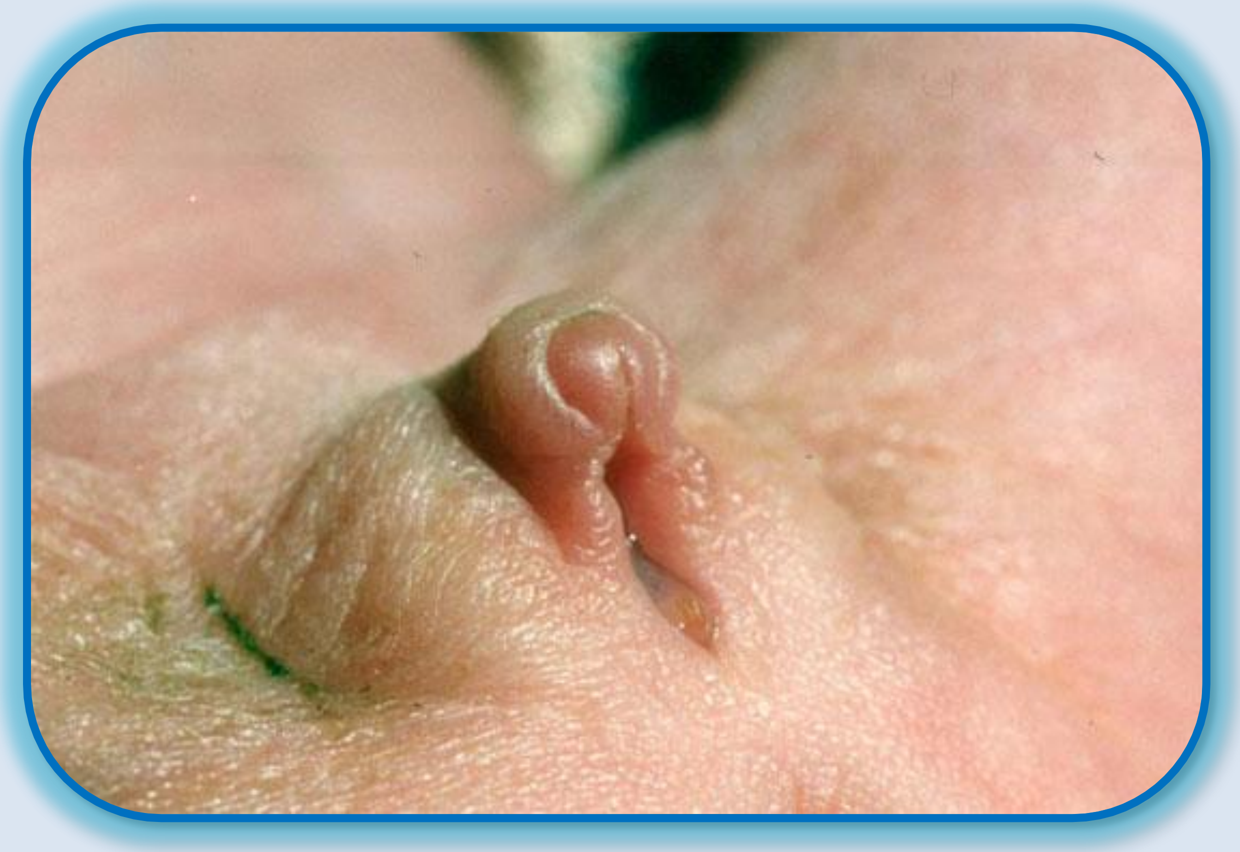
This particular infant was an **under-virilized** male with hypospadias, micropenis, and bifid scrotum (testes were present bilaterally).

Ambiguous Genitalia



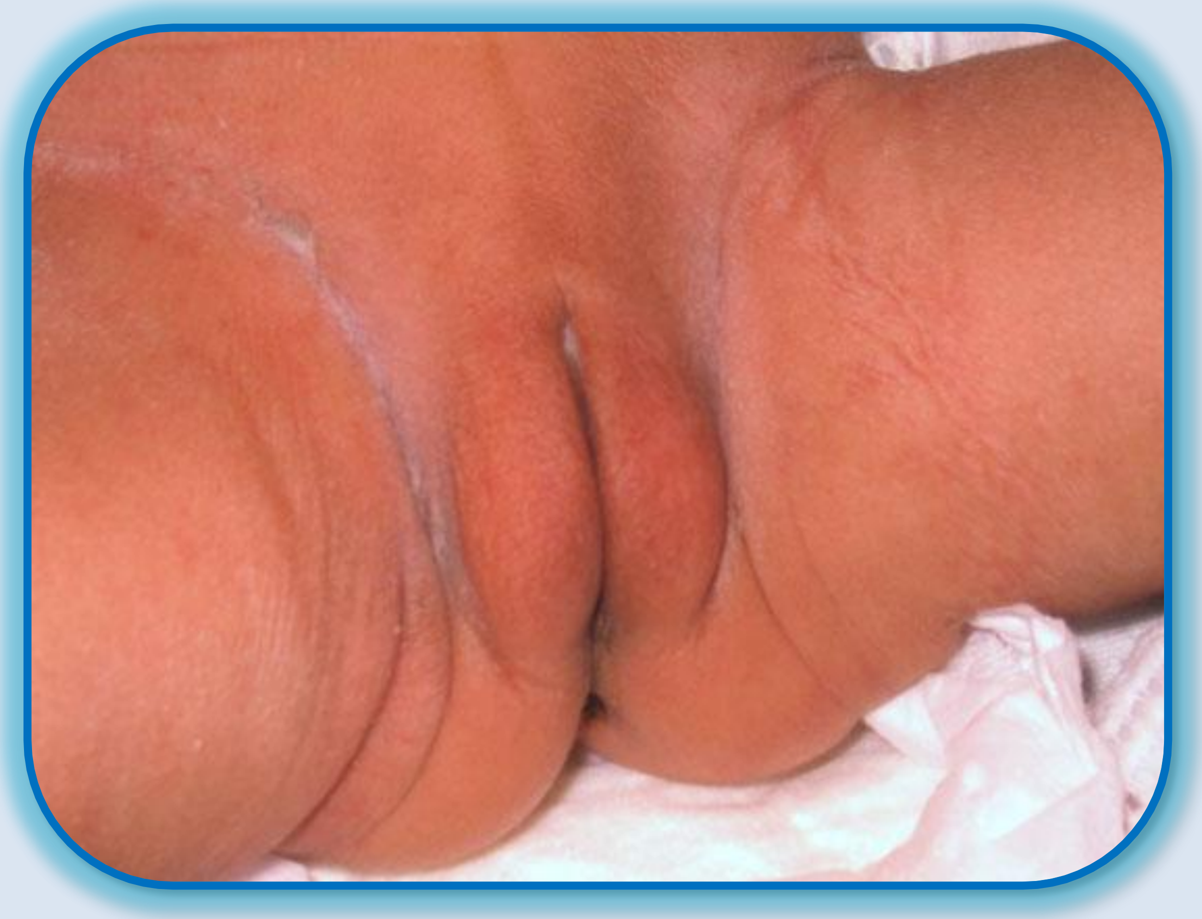
This baby has genitalia that appear similar to the previous photo, but this infant was a **virilized female with 21 hydroxylase deficiency.**

Ambiguous Genitalia



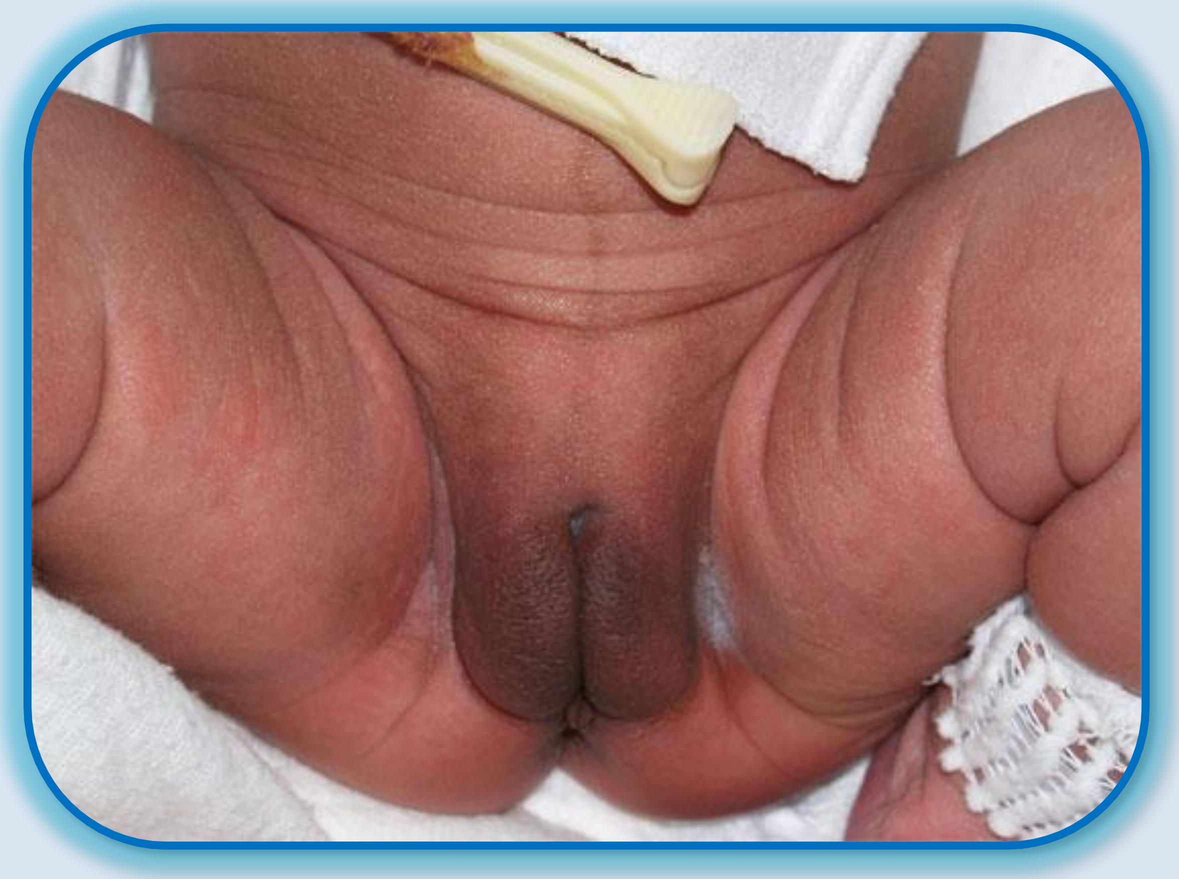
This infant is a male with **micropenis and a cleft scrotum**, but on initial evaluation the gender cannot readily be determined. Genetic, metabolic, and urologic evaluation is necessary.

Normal Female Genitalia



Normal female genitalia in a term infant. Some vernix is visible in the right inguinal crease.

Normal Female Genitalia

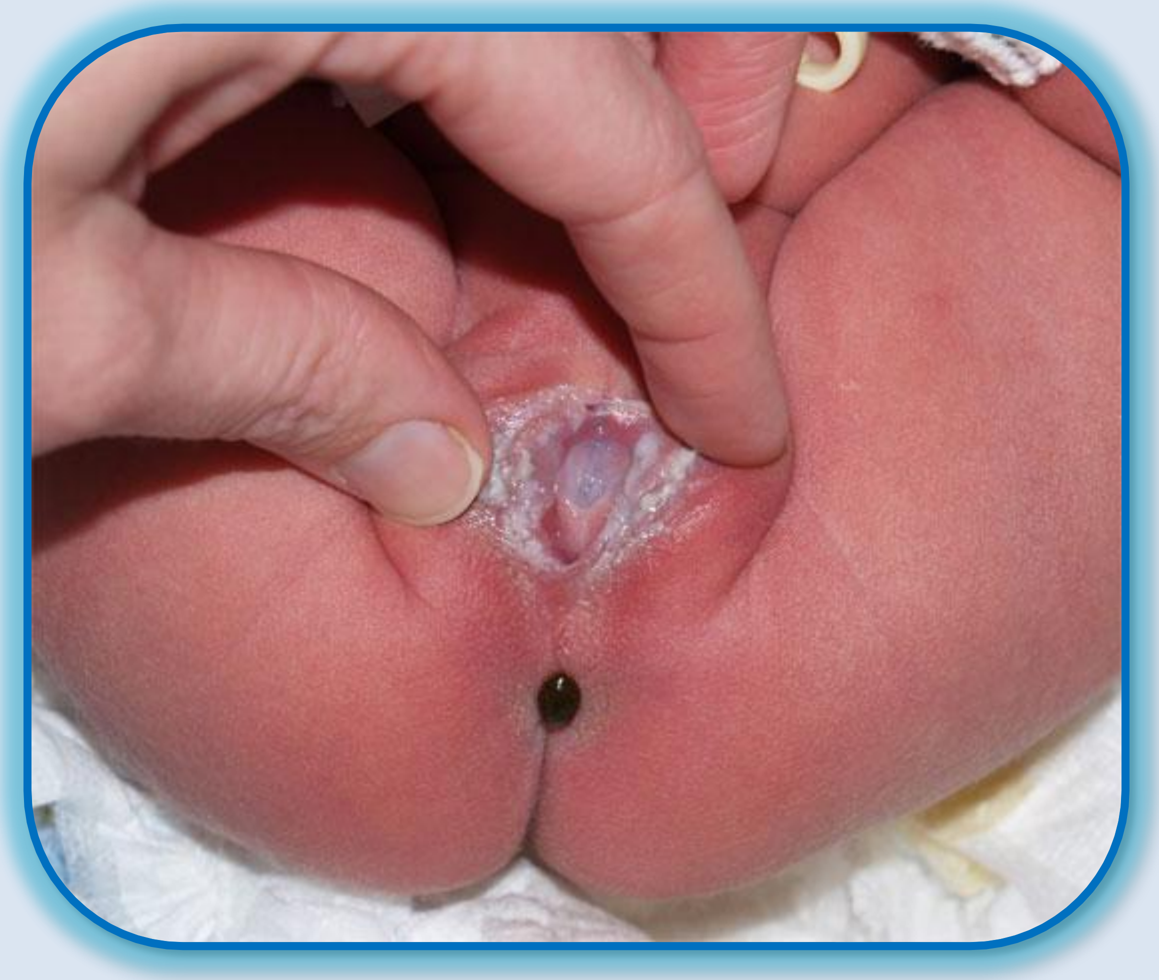


The increased pigment over the labia in this African-American newborn is normal.

Both the color of the parents and exposure to maternal hormones in utero impact the appearance, so a wide variation in pigment tones is expected. Those babies with more melanin tend to have increased pigment in several places: helices of the ears, bases of the nails, in the axillae, at the edge of the umbilical stump, and over the scrotum or labia.

Maternal hormone exposure produces the **linea nigra** (down the middle of the abdomen) that can also be seen in this picture.

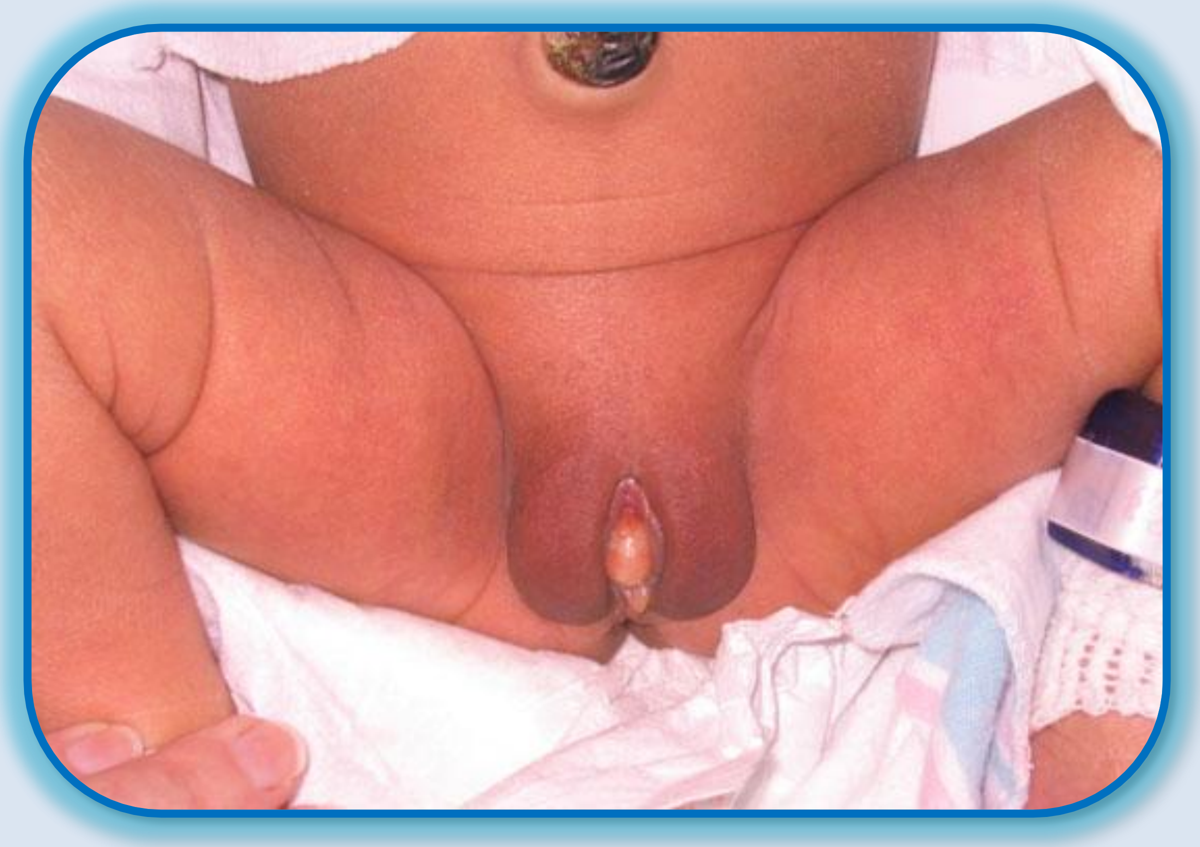
Normal Female Genitalia



When examining the genitalia of a girl, it is important to visualize the hymenal tissue and labia minora. It should appear to have a central opening, as it does here.

White vaginal discharge is extremely common in the newborn period. This infant also has some vernix on the interior surface of the labia majora. No special cleaning is required.

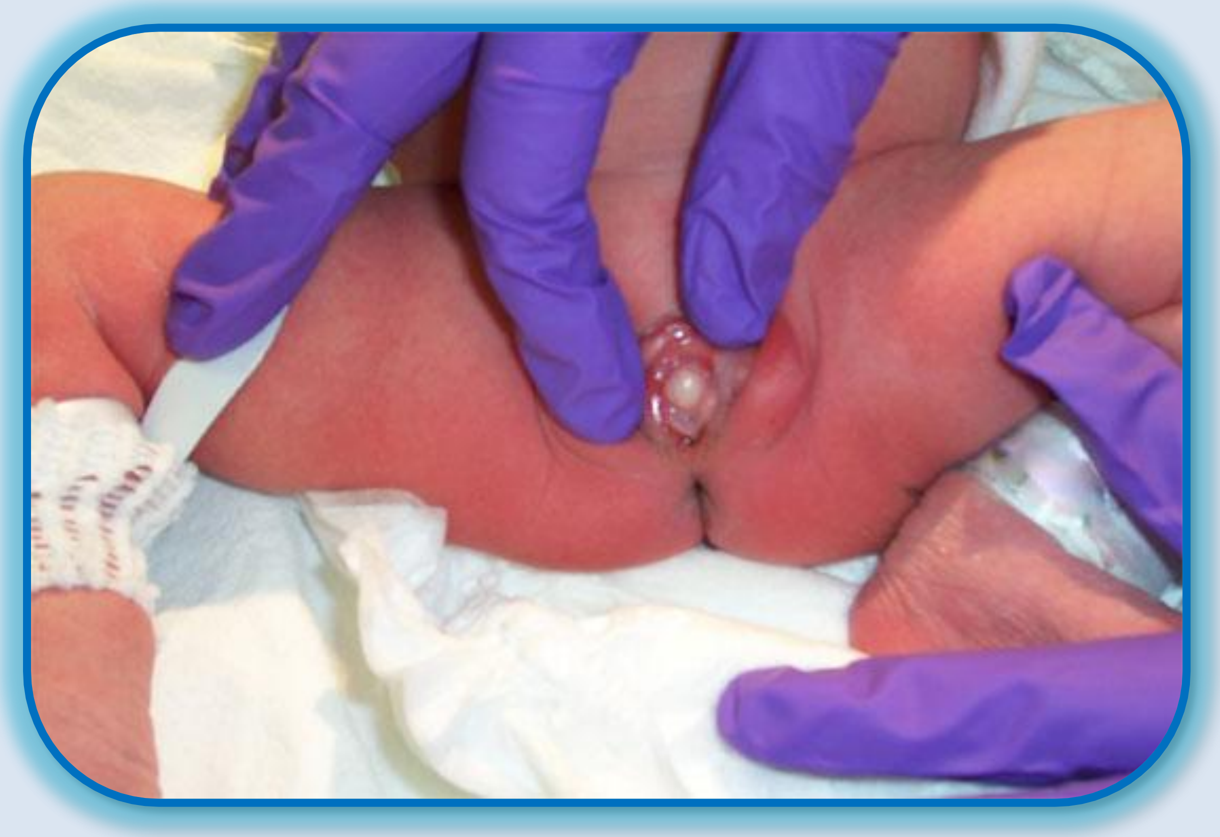
Vaginal Mass



This mass was noted on the discharge examination. It was not readily visible on casual examination of the external genital, but with increased abdominal pressure from crying or with closer inspection of the genitalia, it could be seen. Voiding was not impaired. The imaging studies in this case revealed a multiloculated cyst. The small, light pink tissue inferior to the mass is a hymenal tag, a normal finding.

S

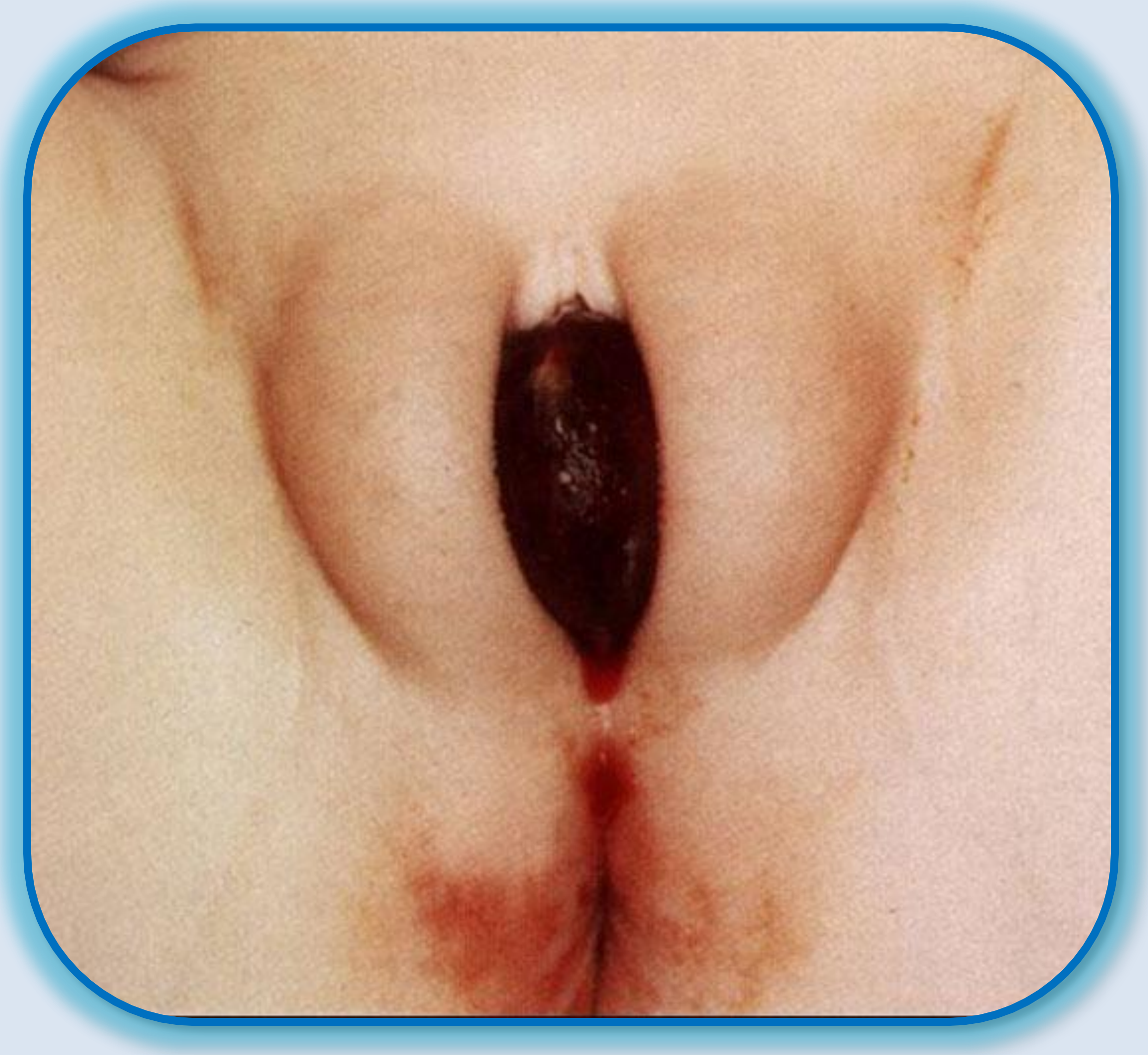
Paraurethral Cyst



This mass, present at birth, was a paraurethral cyst.

The fact that the **hymen can still be seen inferior** to the mass helps differentiate this from imperforate hymen, which could have a similar appearance.

Prolapsed Ureterocele



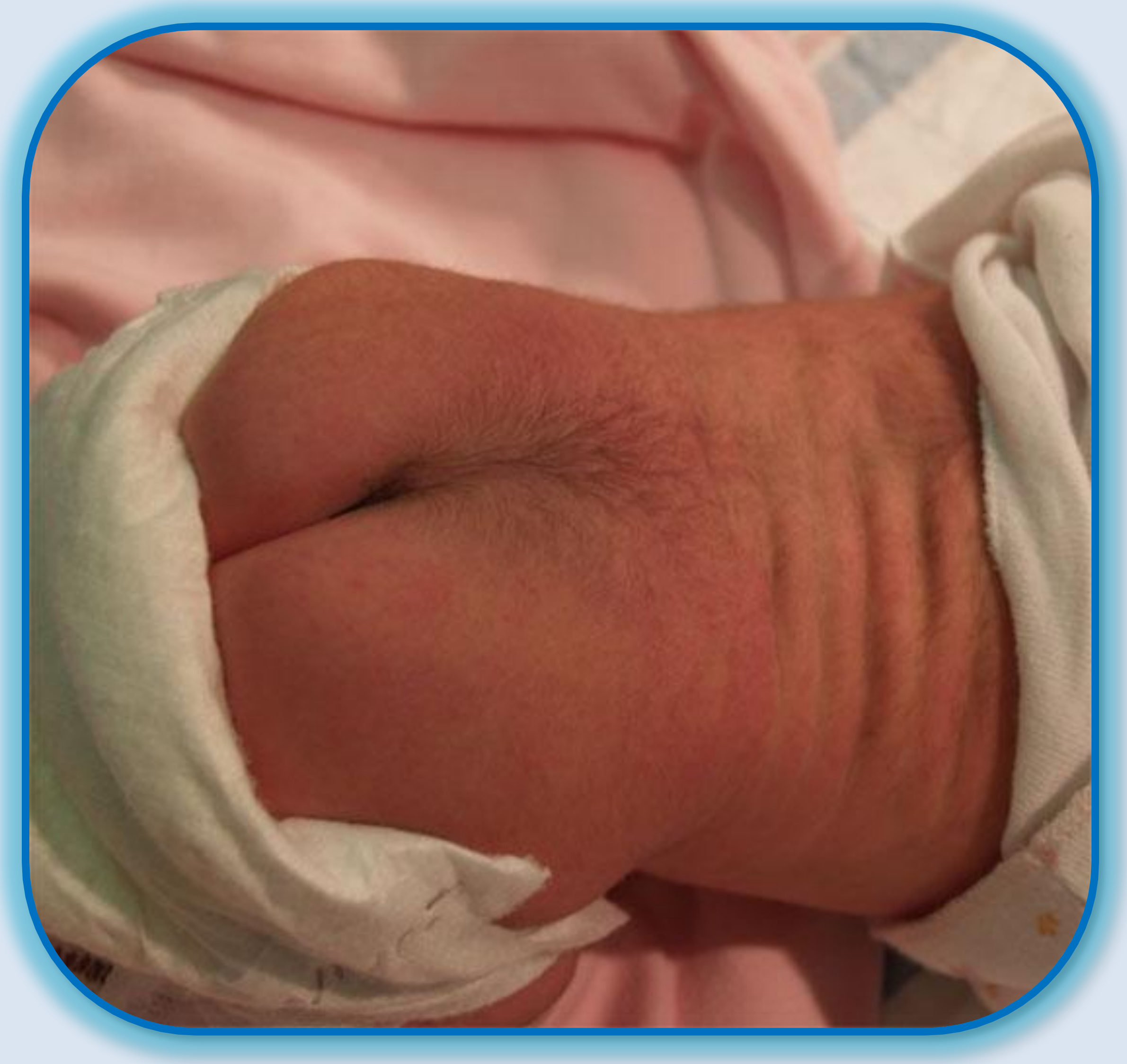
This mass is large enough to obscure all intra-labial landmarks, and is quite hemorrhagic in appearance.

This is a ureterocele which has actually prolapsed through the urethra to be visible externally.

Surgical intervention is necessary in this case.

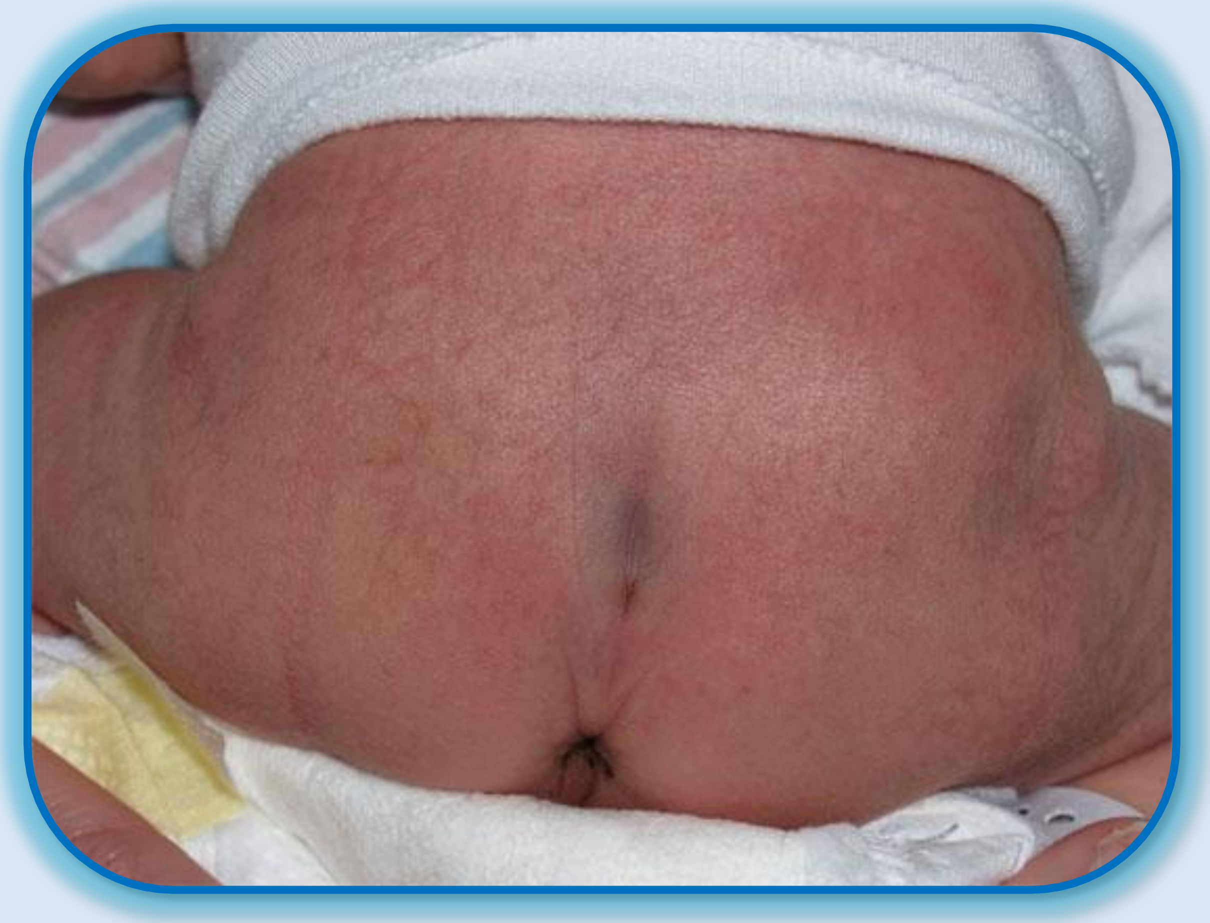
Back

Sacral Hair



Many newborns, especially those with increased skin pigmentation, will have an increased amount of hair over the lower back and sacrum. This appearance is entirely within **normal** limits and **is not** a marker for underlying spinal **dysraphism**.

Sacral Dimple

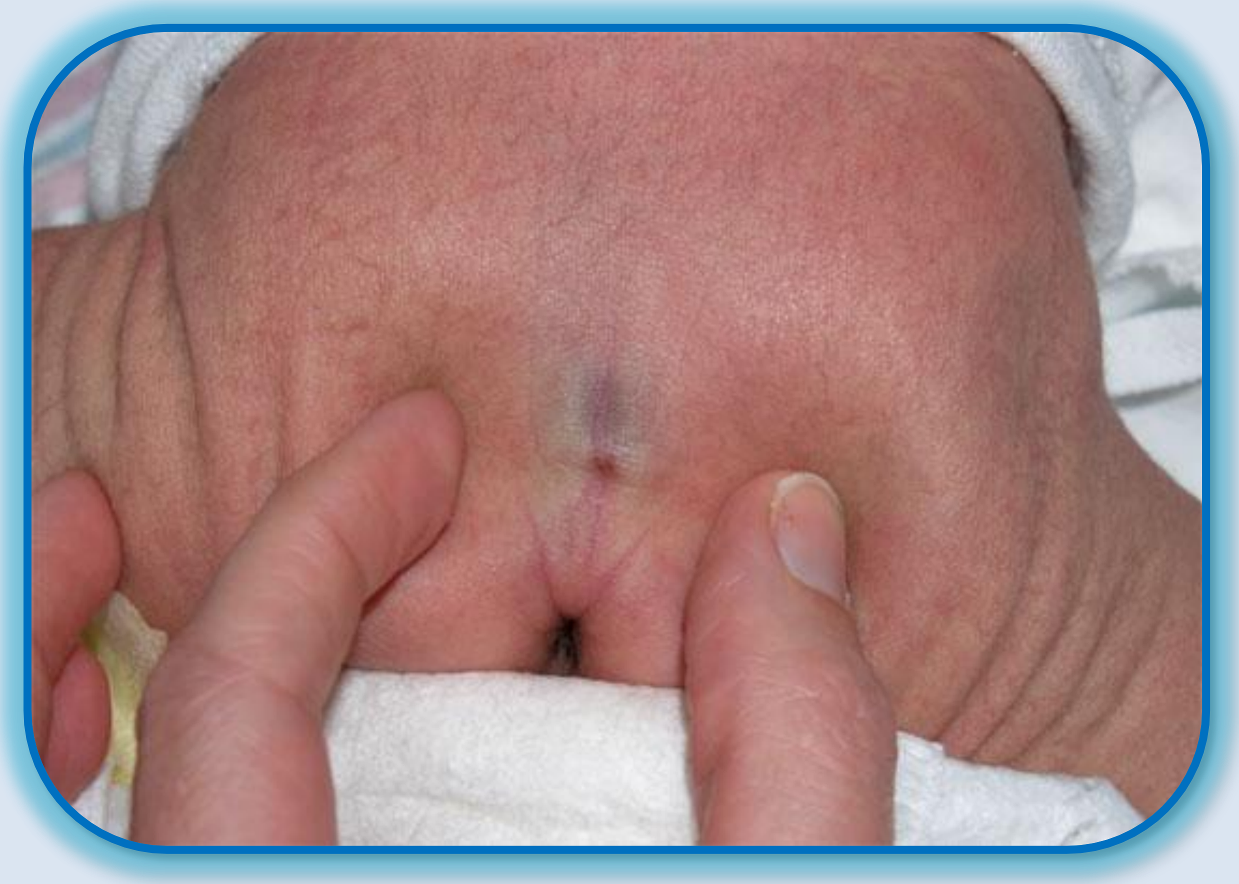


Sacral dimples are a common finding on physical exam. Most of these dimples are **"simple dimples"** and require **no** further evaluation.

A simple dimple is one that is located within **2.5 cm of the anus**, has a **base that can be visualized** and is **not associated with** other abnormalities on exam.

The dimple in this photo is the tiny dark brown shadow below the slate grey patch at the superior end of the gluteal crease.

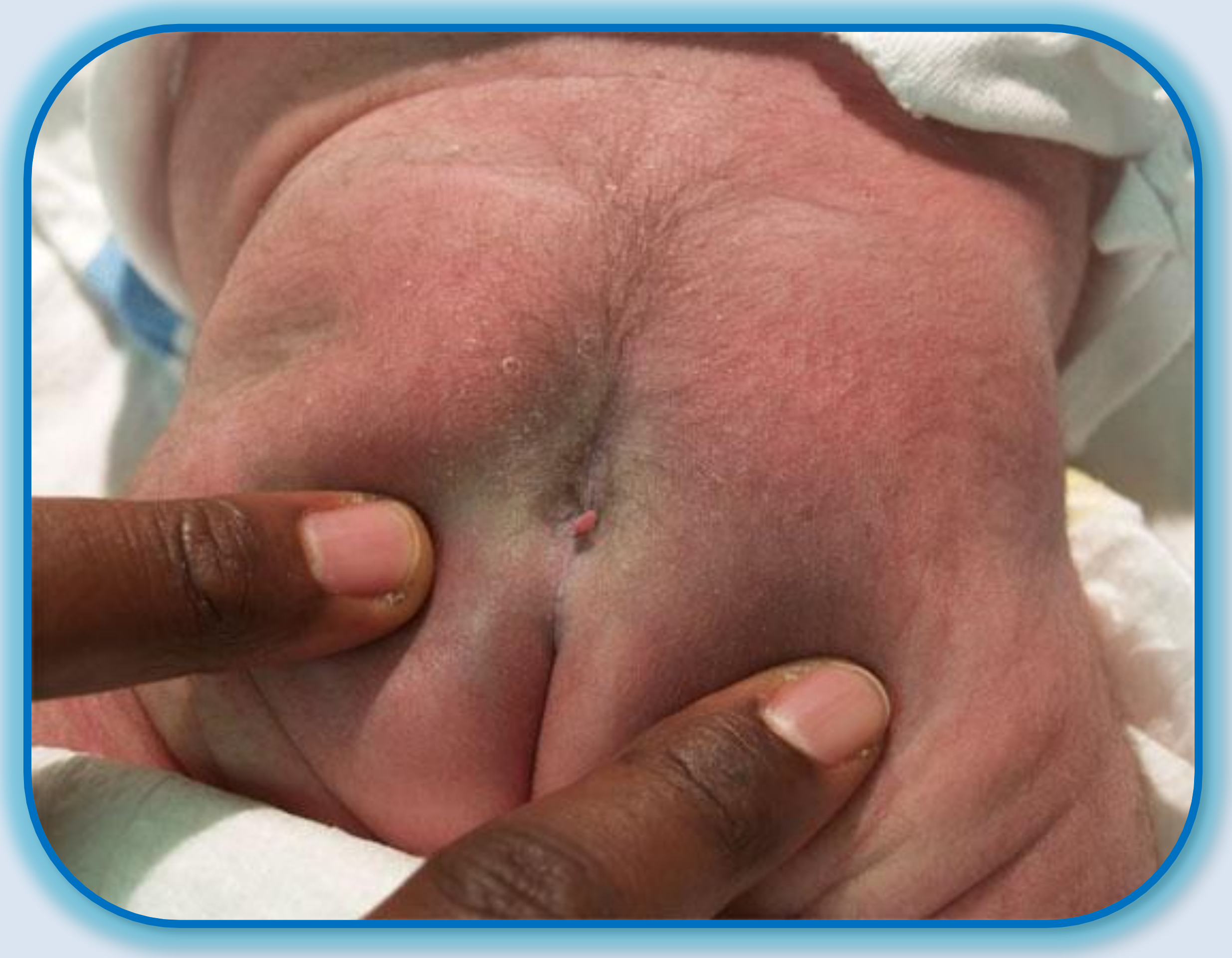
Sacral Dimple



Here the skin lateral to the dimple is stretched, skin can be seen covering the entire dimpled area. **If** the base could not be seen, this would be called a coccygeal pit.

Although fistulas above the gluteal cleft may be associated with spinal dysraphism, **coccygeal pits are benign** and do not need imaging.

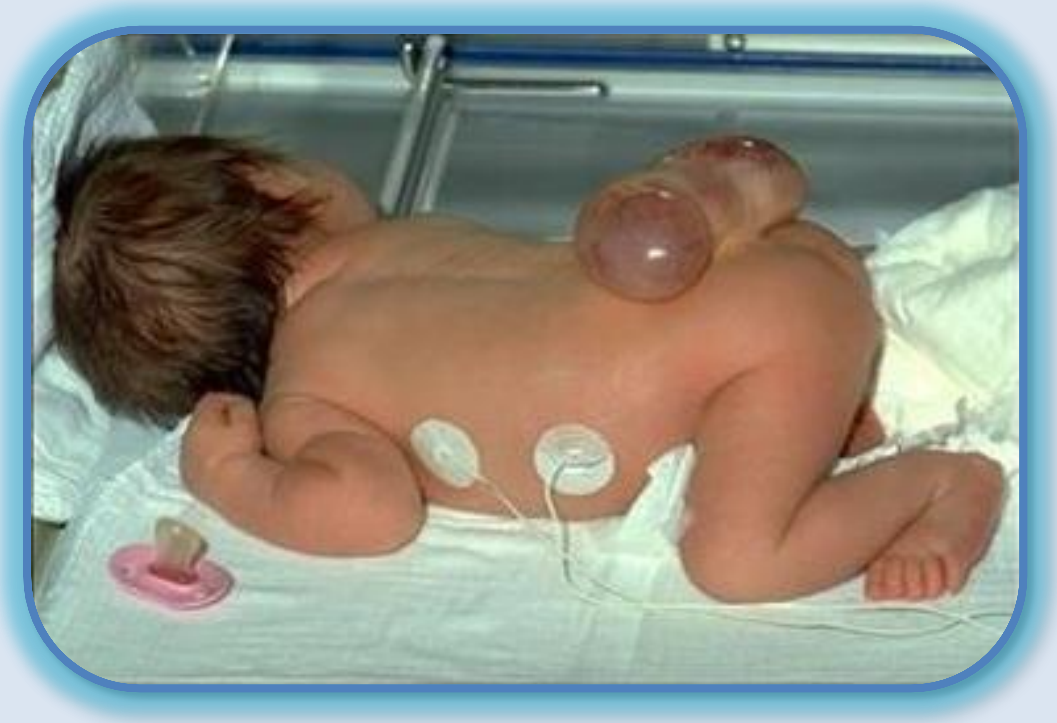
Sacral Skin Tag



Skin tags in the sacral area are also **potential indicators of spinal dysraphism**. In some cases, the "tag" may be a residual tail.

This skin tag was quite small and appeared to be very superficial, but **spinal ultrasound** was done as a screening measure. In this case, the ultrasound was normal and no further testing was needed.

Meningomyelocele

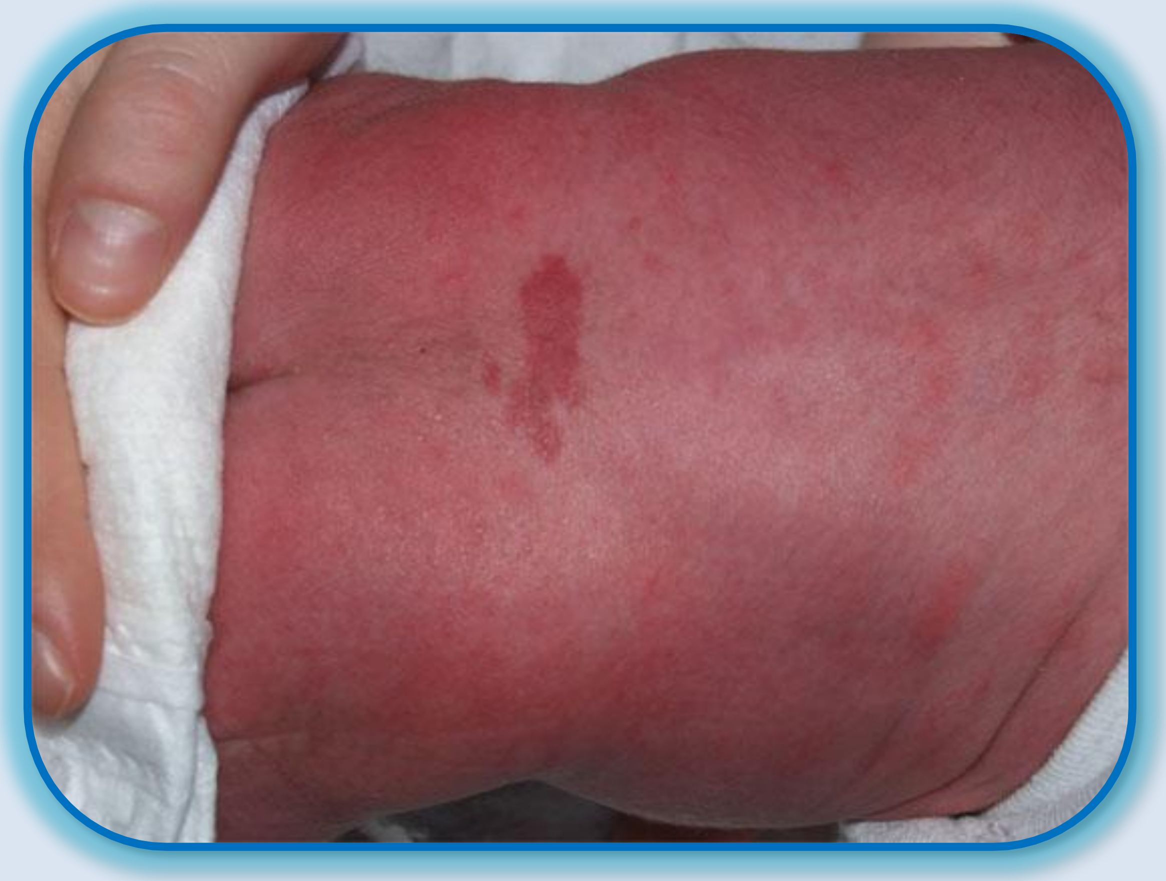


It is a type of neural tube defect that results from incomplete closure of the posterior spine during early development. The **lumbar spine is the most common** location for this abnormality. When this diagnosis is made prenatally, **caesarian section is usually recommended**, and the birth is planned at a location where a pediatric neurosurgeon and level 3 NICU are available.

At delivery, the defect should be protected with sterile saline-soaked gauze, covered by plastic wrap, and the infant kept in a **side-lying** or prone position.

Infants with this condition frequently have **associated abnormalities**; **Arnold Chiari malformation**, dislocated hips, bowel or bladder dysfunction, and lower extremity weakness are all common co-morbidities.

Butterfly Mark

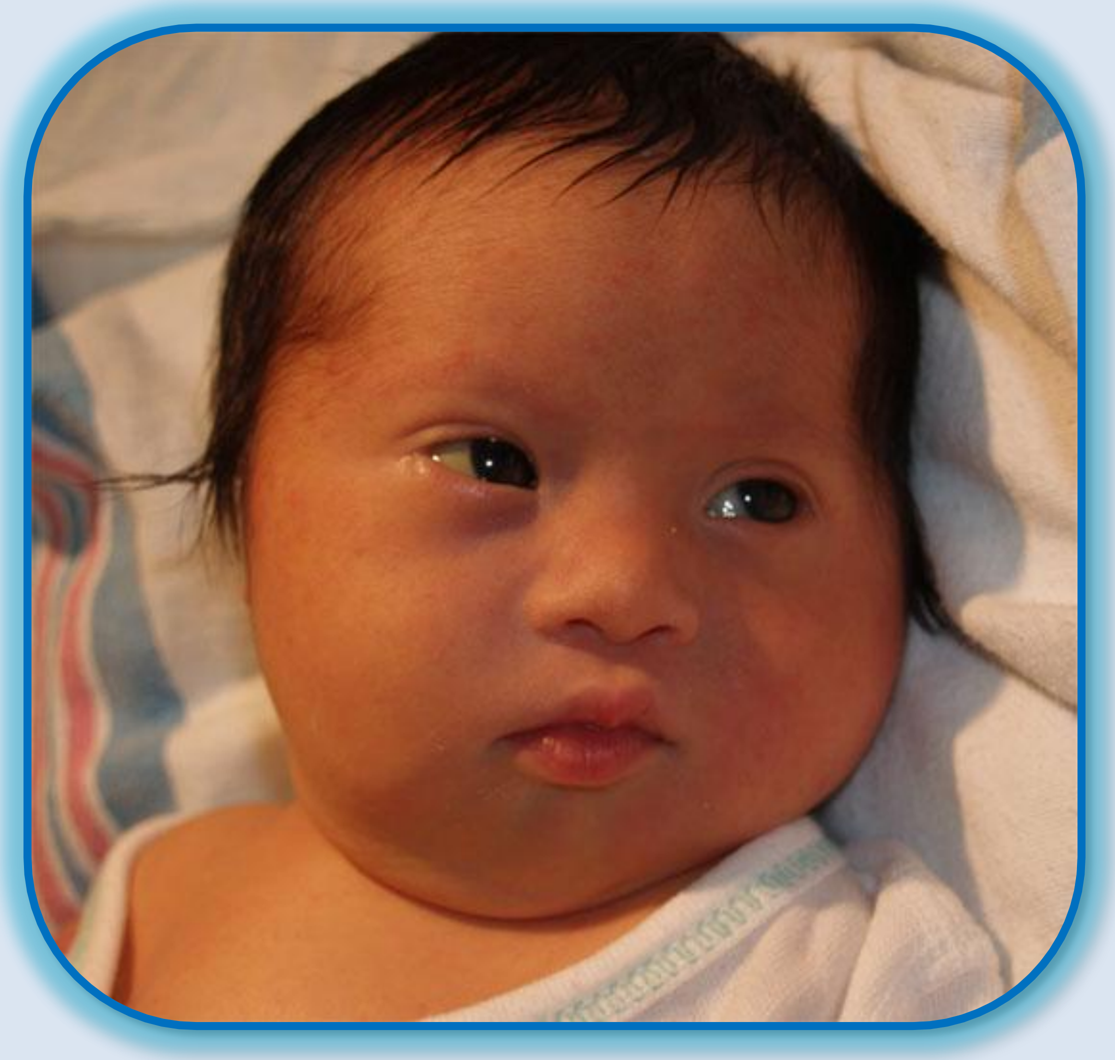


Congenital midline vascular lesions usually raise questions about occult spinal dysraphism, but so far the literature is inconclusive. Some authors suggest isolated midline port wine stains and medial **telangiectatic vascular nevi** ("butterfly marks") are benign and do not require further evaluation. Occult **dysraphism** is much more likely if **two markers** are present.

As an isolated finding, the need for evaluation is debatable.

Dysmorphology

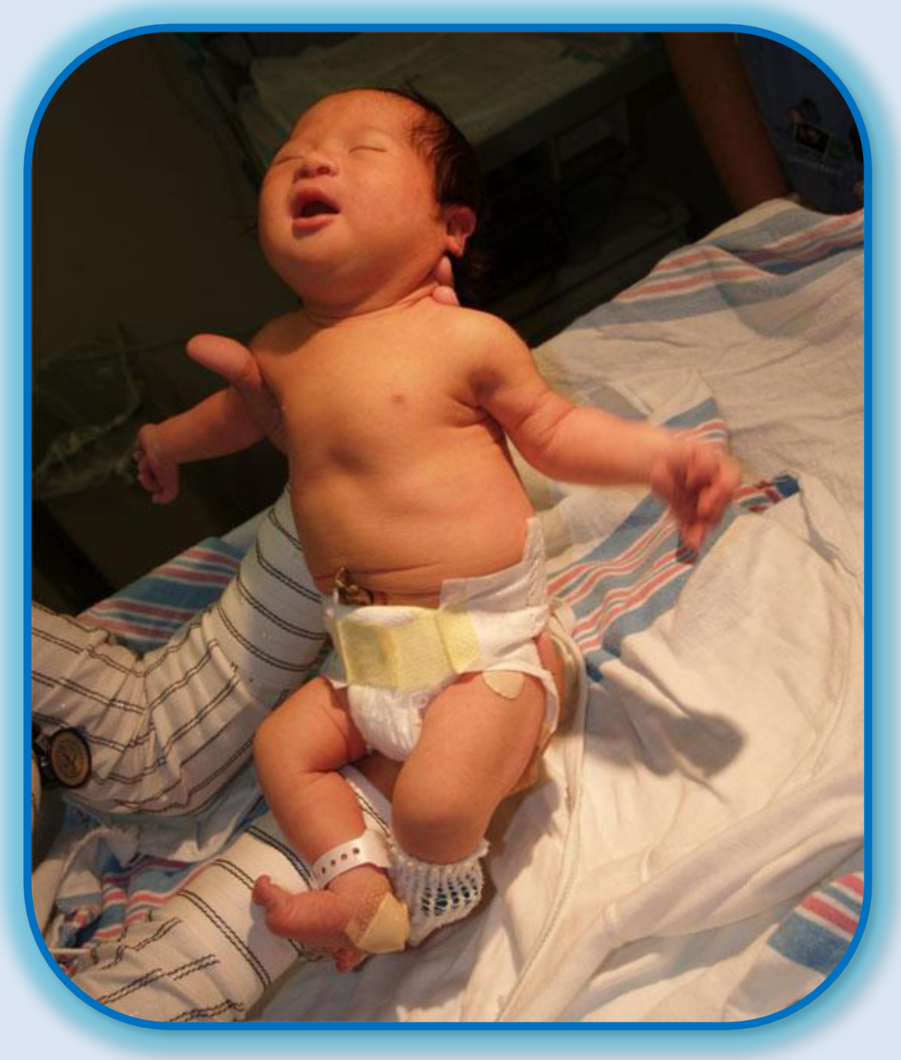
Down's Syndrome



Down's syndrome is clearly the **most common and recognizable genetic syndrome** known, although at times the physical features may be difficult to identify in a newborn.

This infant has typical facial features of Down's syndrome: up slanting palpebral fissures, a suggestion of epicanthic folds, and a flat nasal bridge.

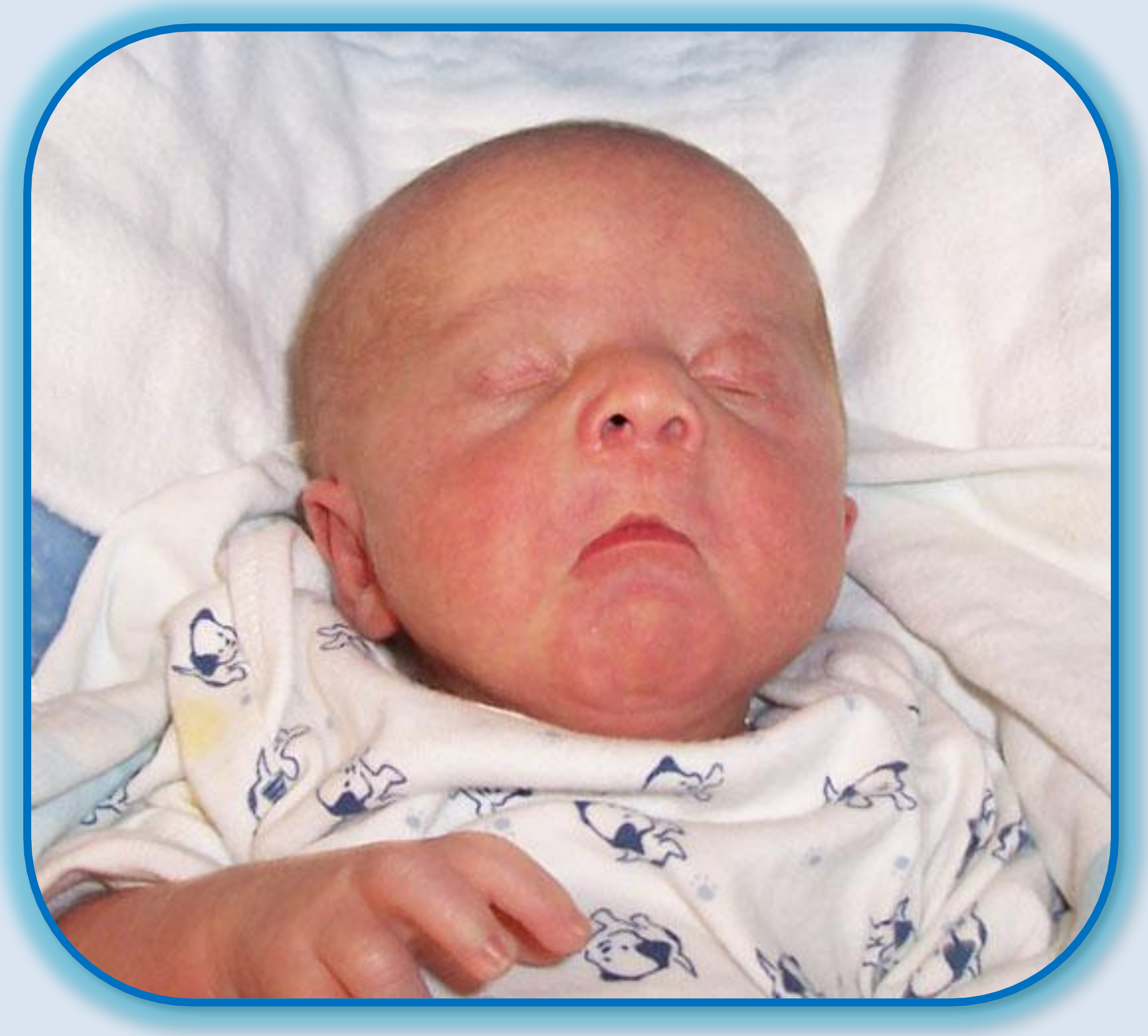
Down's Syndrome



The other striking physical finding in this newborn was **hypotonia**. When this infant was lifted off the bed, the examiner had to give much more than the typical amount of support to the infants' head and shoulders, and still the arms flop back towards the bed.

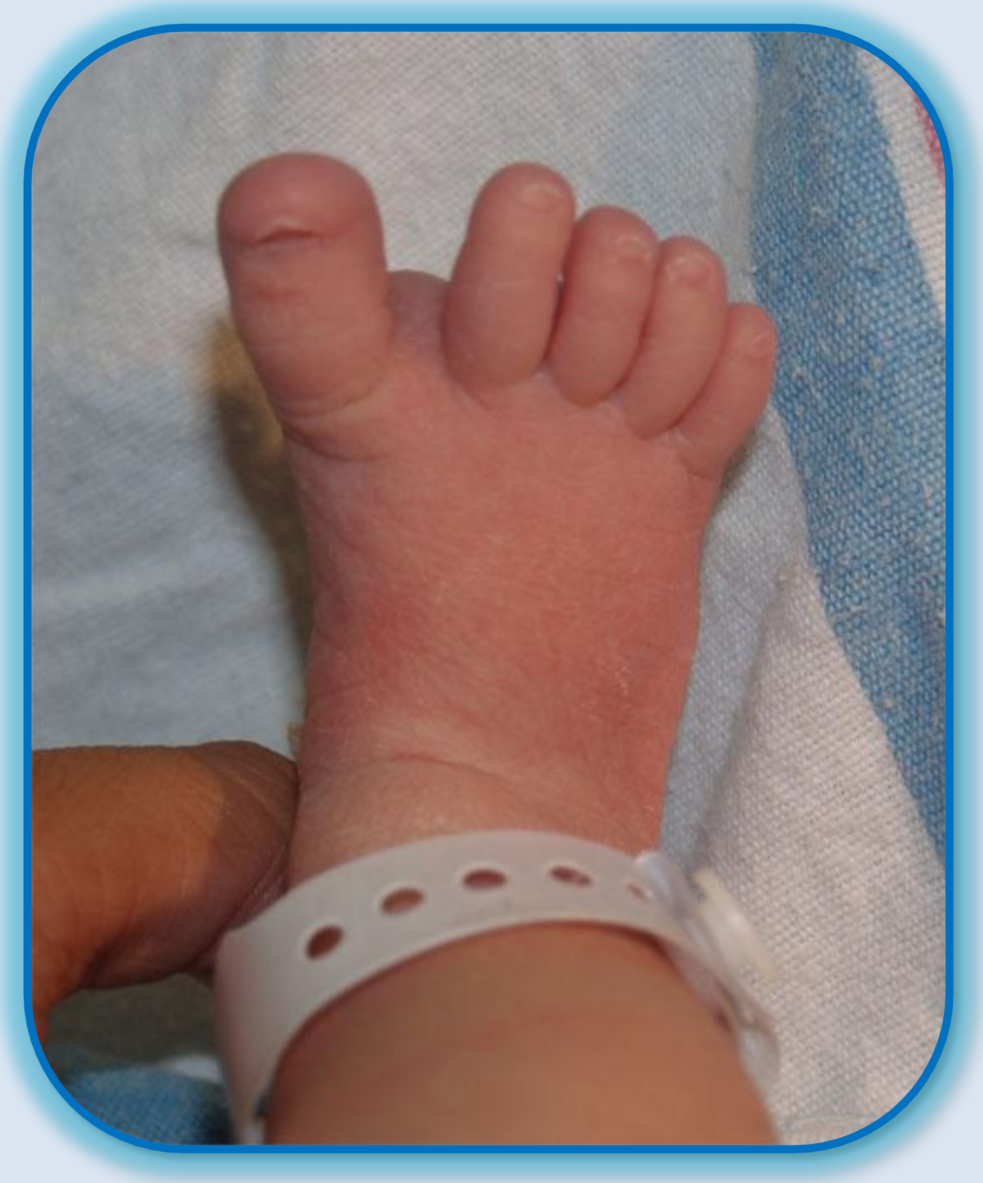
For a newborn, hypotonia of this degree can significantly impact the baby's ability to feed well, so breastfeeding should be carefully monitored.

Down's Syndrome



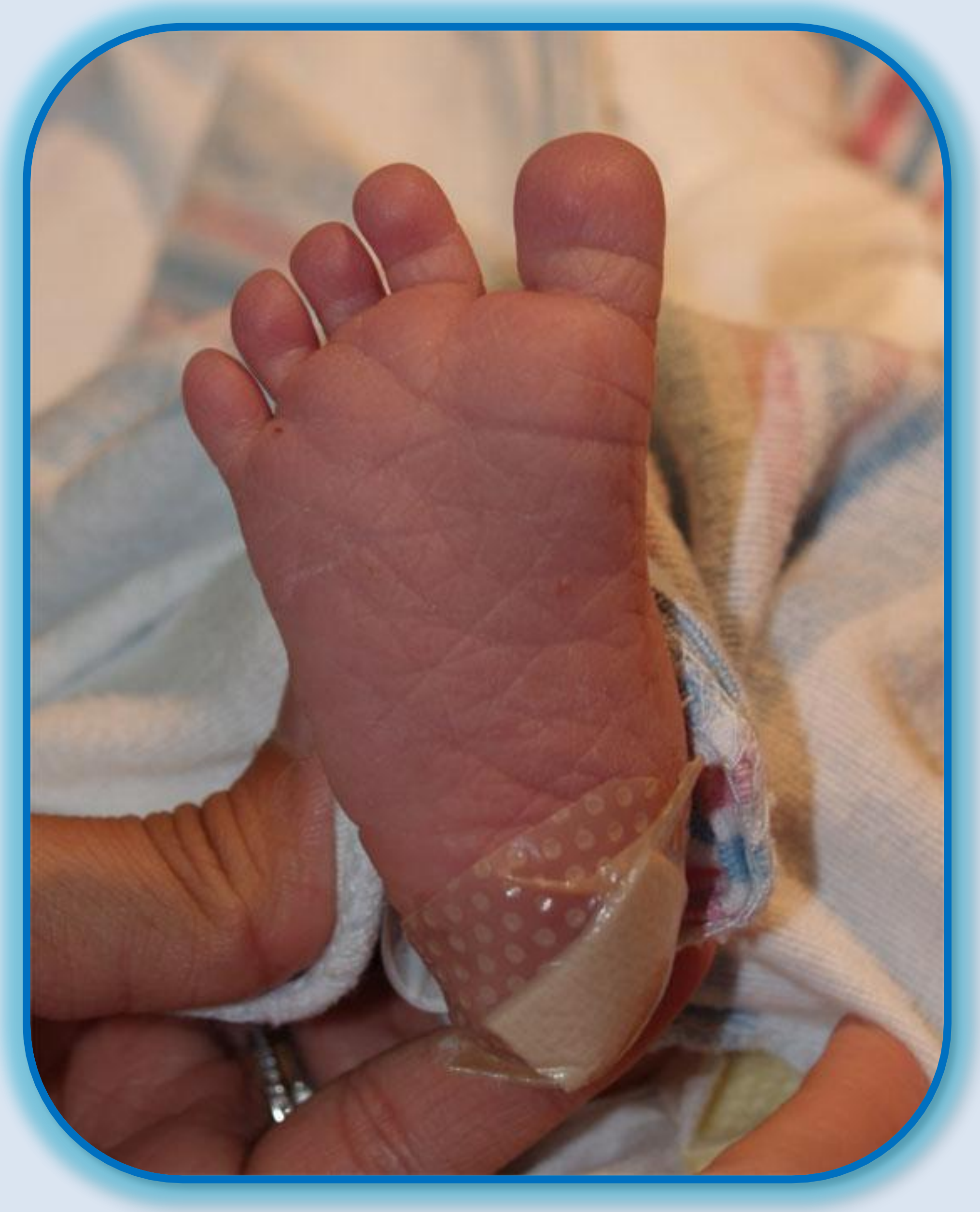
In contrast, this preterm newborn does not exhibit typical facial features of Down's syndrome. In this case, the diagnosis was made after **duodenal atresia** was detected. Because trisomy 21 affects all the cells in the body, it is reasonable to screen every baby with Down's syndrome with cardiac echo (**heart defects are noted in 50%**), and with a complete blood count (as **congenital leukemia** can occur).

Sandal Gap Deformity



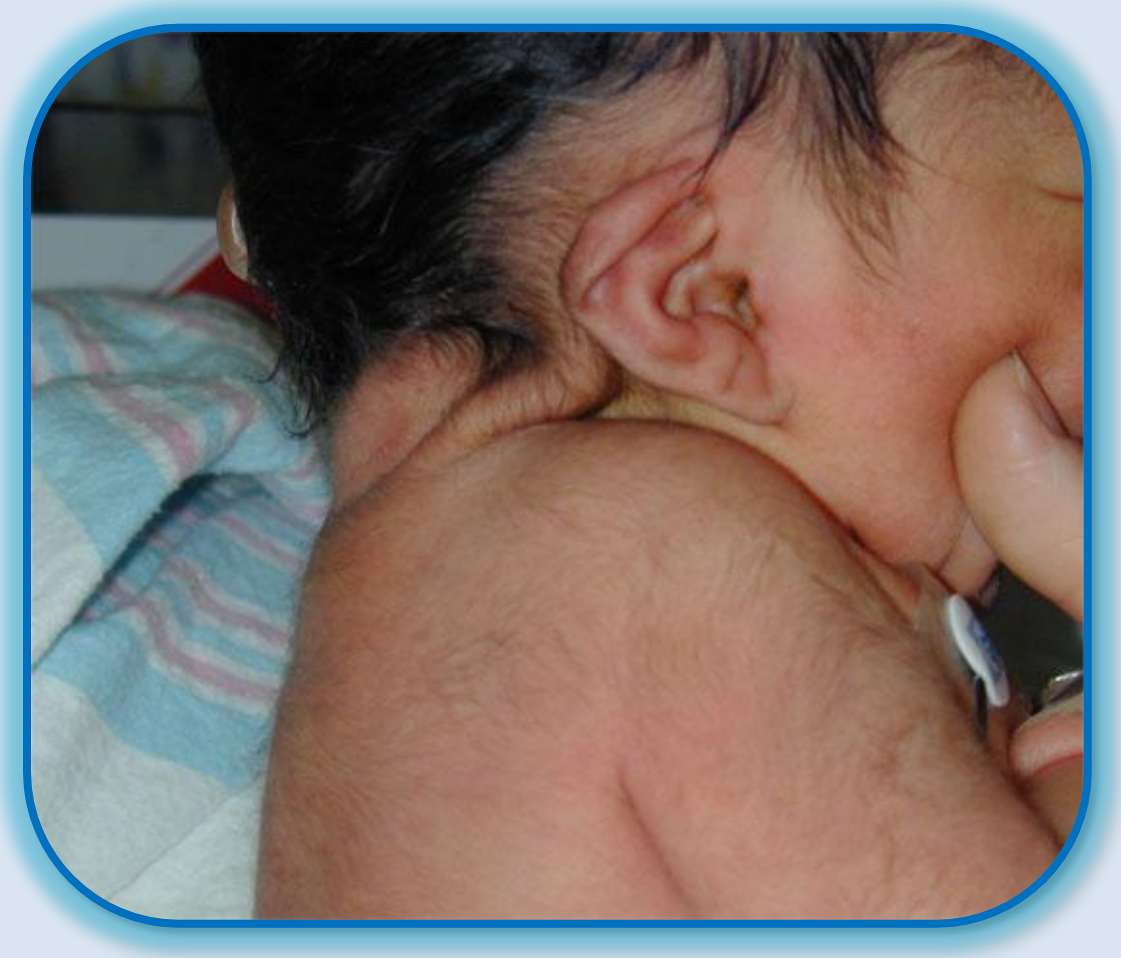
Another physical finding in many infants with Down's syndrome is an increased gap between the great and first toes. While this finding **can occur as a familial trait**, when it occurs in constellation with other features of Down's, it supports the diagnosis.

Sandal Gap Deformity



Viewed from the plantar surface, the gap between the toes is even more noticeable.

Loose Nuchal Skin

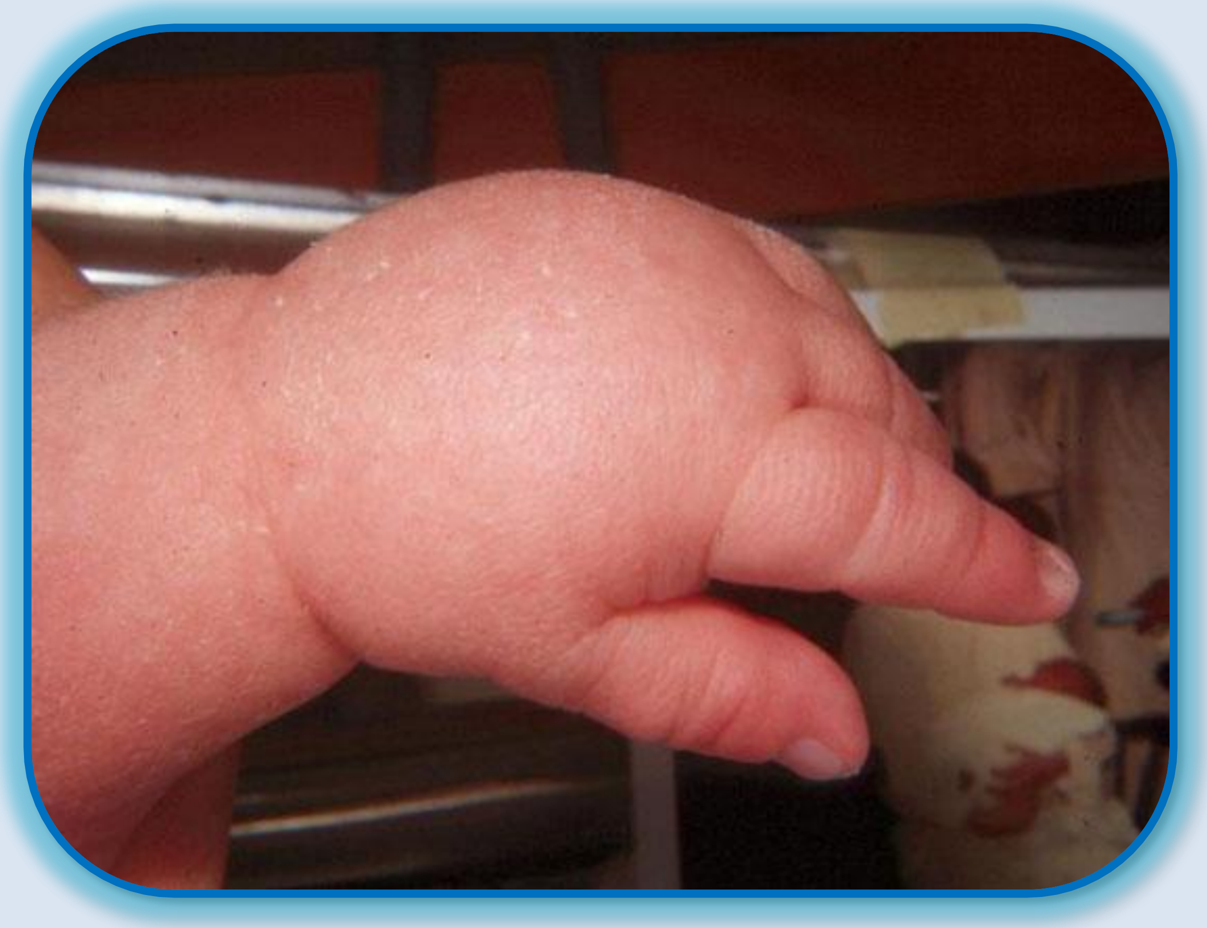


Abnormal skin folds over the back of the neck can be a marker for genetic abnormality. **Increased nuchal thickness** can be seen on **prenatal ultrasound** in some infants with **Down's syndrome**, and **increased nuchal lucency** (may be related to **lymphedema**) has been noted in fetuses with **Turner's syndrome**.

In the photo above, the skin over the back of the neck appears loose and floppy. **Webbing** may also be present, but it is hard to appreciate from this angle.

This infant was subsequently diagnosed with Turner's syndrome.

Edema of the Hand

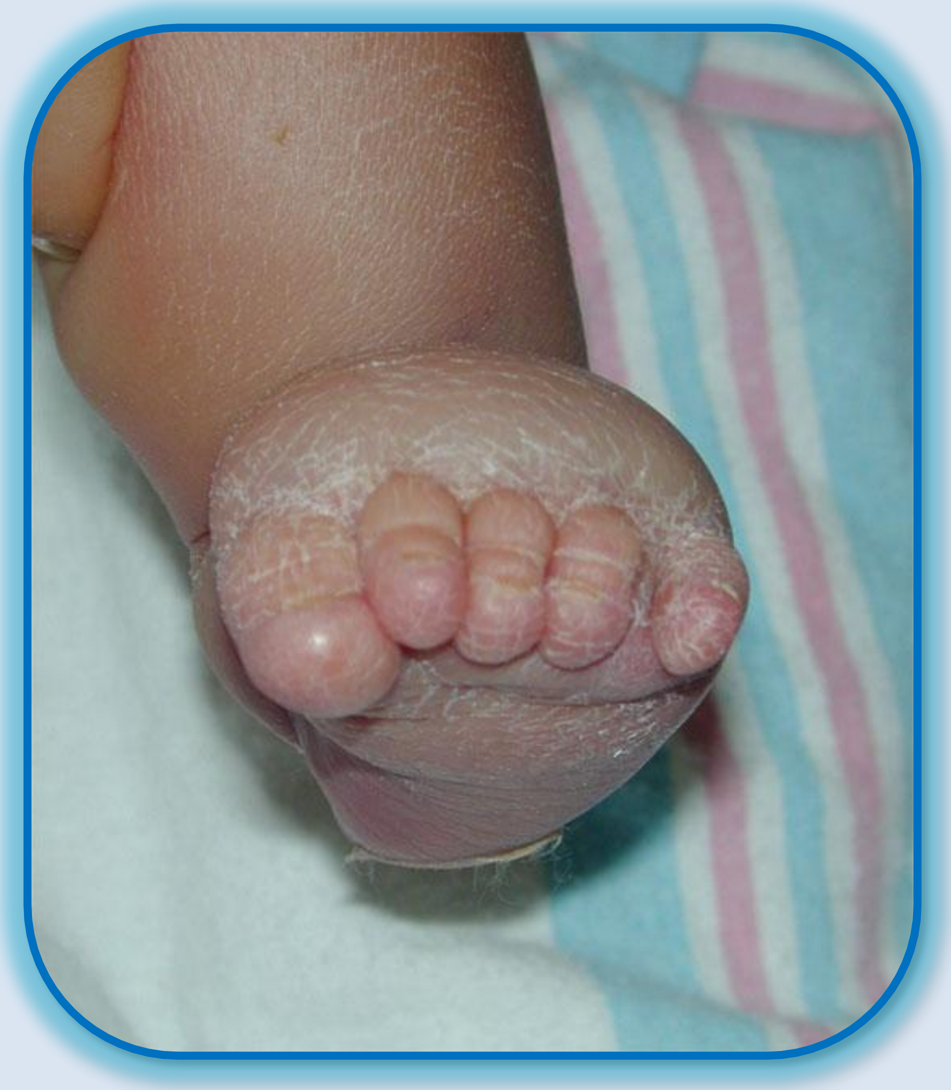


Congenital lymphedema is a frequent finding in those patients who are subsequently diagnosed with **Turner's syndrome**.

Although not all edema is related to Turner's syndrome, the diagnosis should be considered in infants who have this finding.

Other physical findings associated with this disorder include short stature, short fourth metacarpal, webbed neck, high palate and nail dysplasia. In the photo above, the **edema of the hand** is striking & Turner's syndrome was the underlying diagnosis.

Edema of the Feet

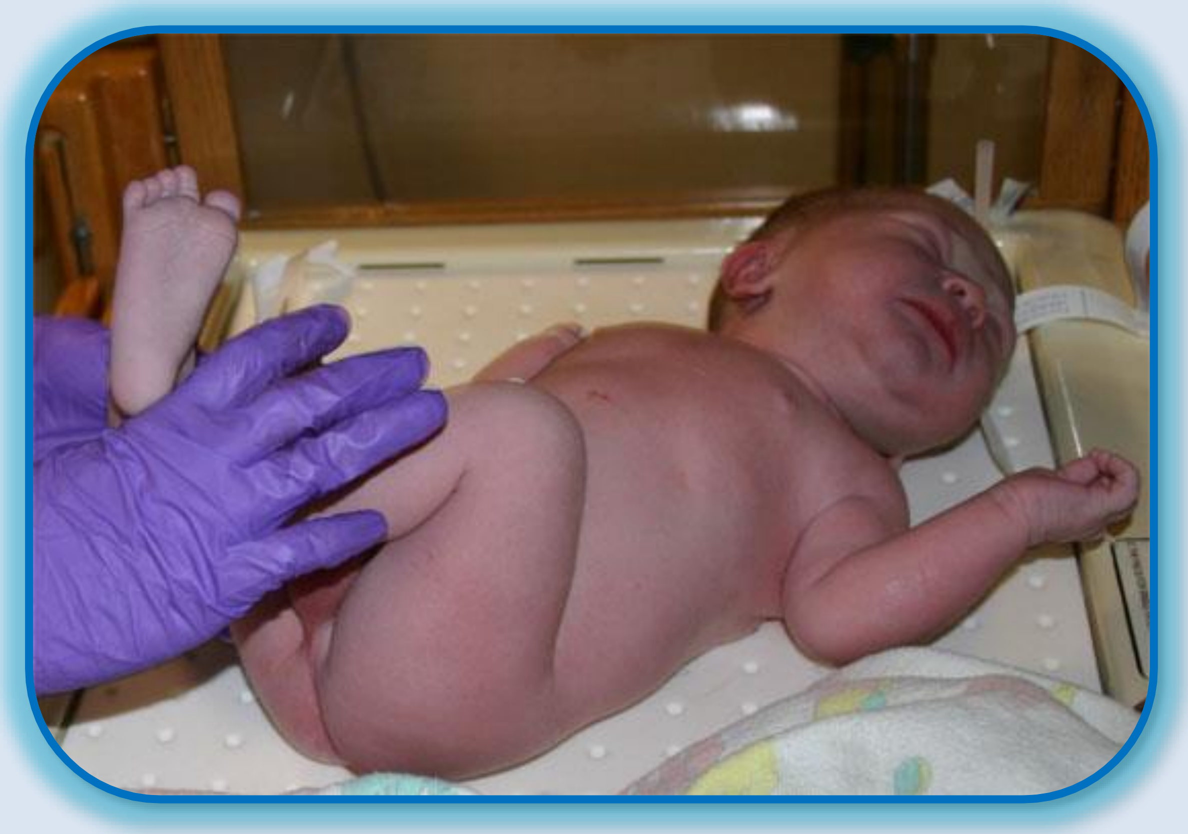


Here is an example of **lymphedema** of the feet as a result of **Turner's syndrome**. From this angle, the excessive puffiness behind the toes can be easily seen.

Chromosomal testing confirmed the clinical diagnosis.

General

Appropriate for Gestational Age



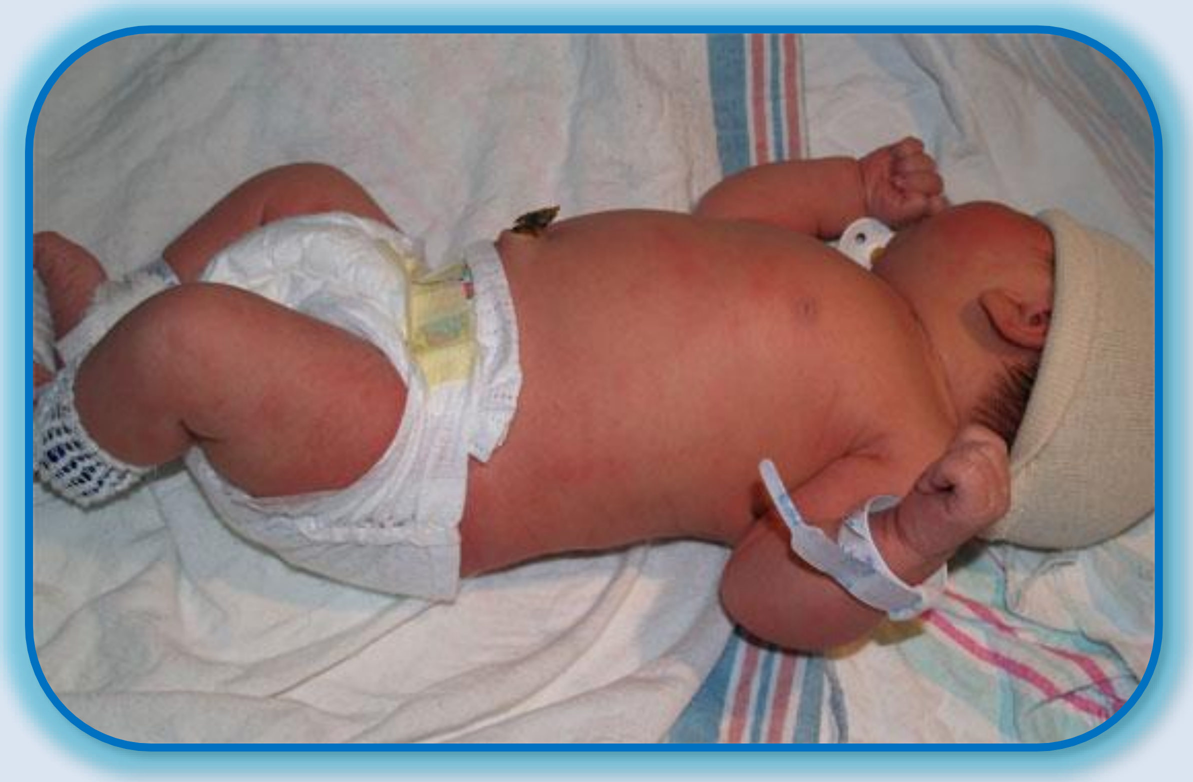
One of the earliest observations an examiner can make when evaluating a newborn is that of size.

Because small term babies and large preterm babies may be the same weight but have very different problems, **the categorization of size should always be made in relationship to the gestational age.**

Babies who are large or small for their age need special consideration.

Typically, term babies are appropriate for gestational age **(AGA)** when their weights fall between 5lb 12oz (2.5kg) and 8lb 12 oz (4kg). This baby, at about 7 pounds is AGA.

Large for Gestational Age

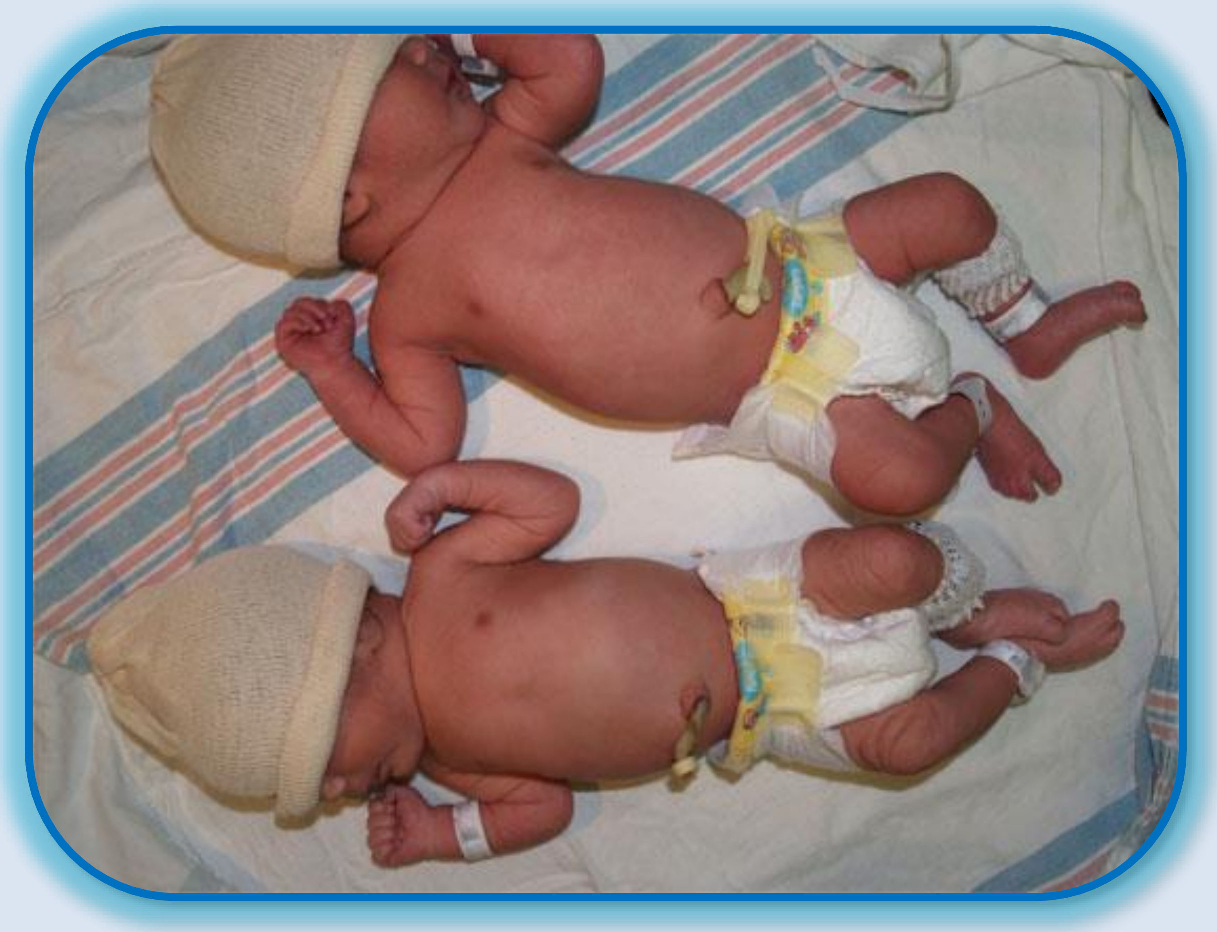


This infant is large for gestational age **(LGA)** with a birth weight of about 9 1/2 pounds.

These infants have much more glycogen at birth, but **hypoglycemia** may still be a problem as many of these babies are infants of diabetic mothers. When the ample glucose supply is interrupted with the cutting of the umbilical cord, the babies' pancreas may take a while to down-regulate, leaving the infant with high insulin and low glucose levels in the meantime.

Polycythemia may also be present. The plump extremities, torso and full cheeks of this infant are typical features of an LGA baby.

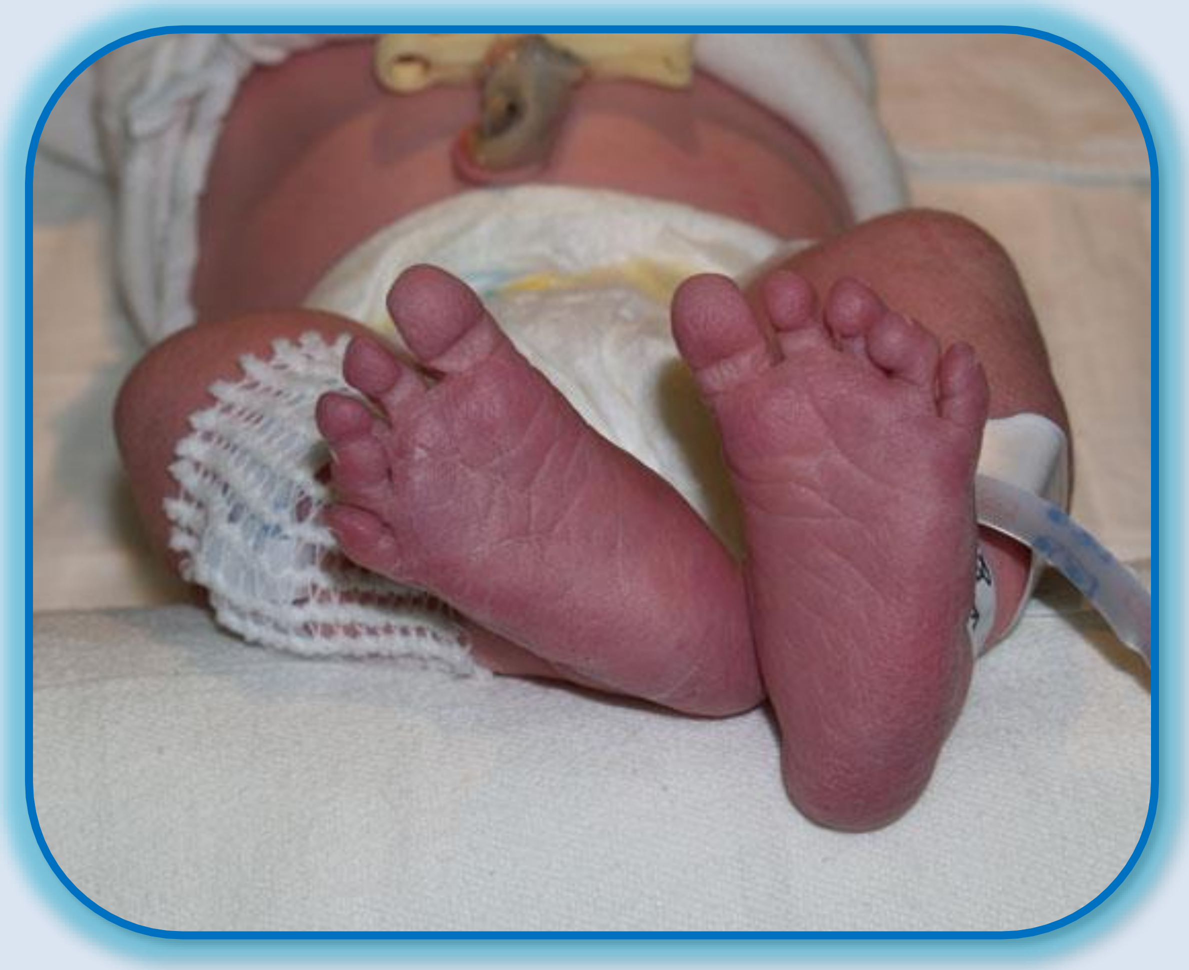
Discordant Size



When it comes to evaluating multiples, comparison of size between individuals is also important. **Discordance between siblings may indicate placental inequalities, twin-twin transfusion syndrome, or other problems.**

The smaller twin, weighed 5 pounds and the larger one was over 6 pounds. **Hematocrits** were checked on both and were normal.

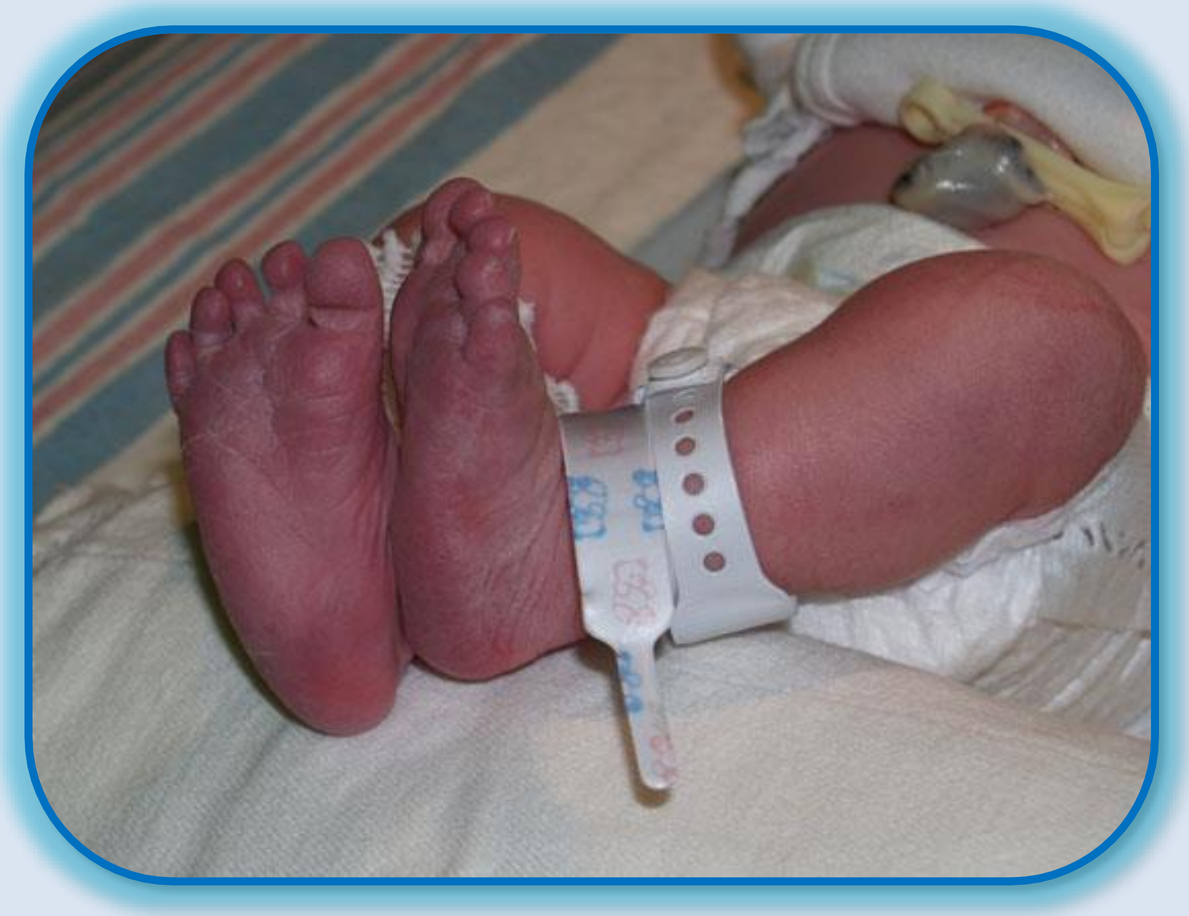
Acrocyanosis



Shortly after birth, cyanosis of the hands, feet, and perioral area are common findings. Notice the difference between the color in the feet and the color of the legs and abdomen.

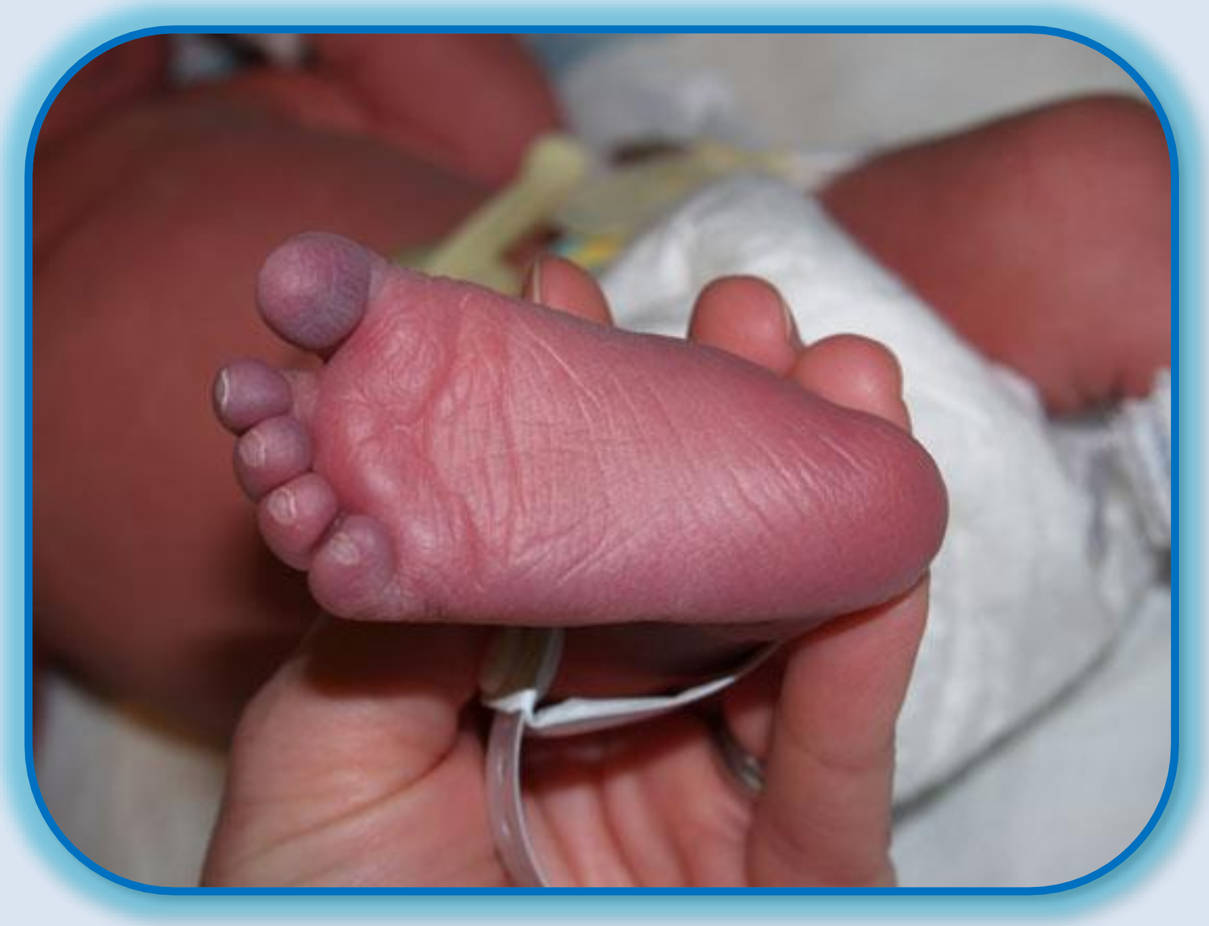
Acrocyanosis typically resolves in 24 - 48 hours.

Acrocyanosis



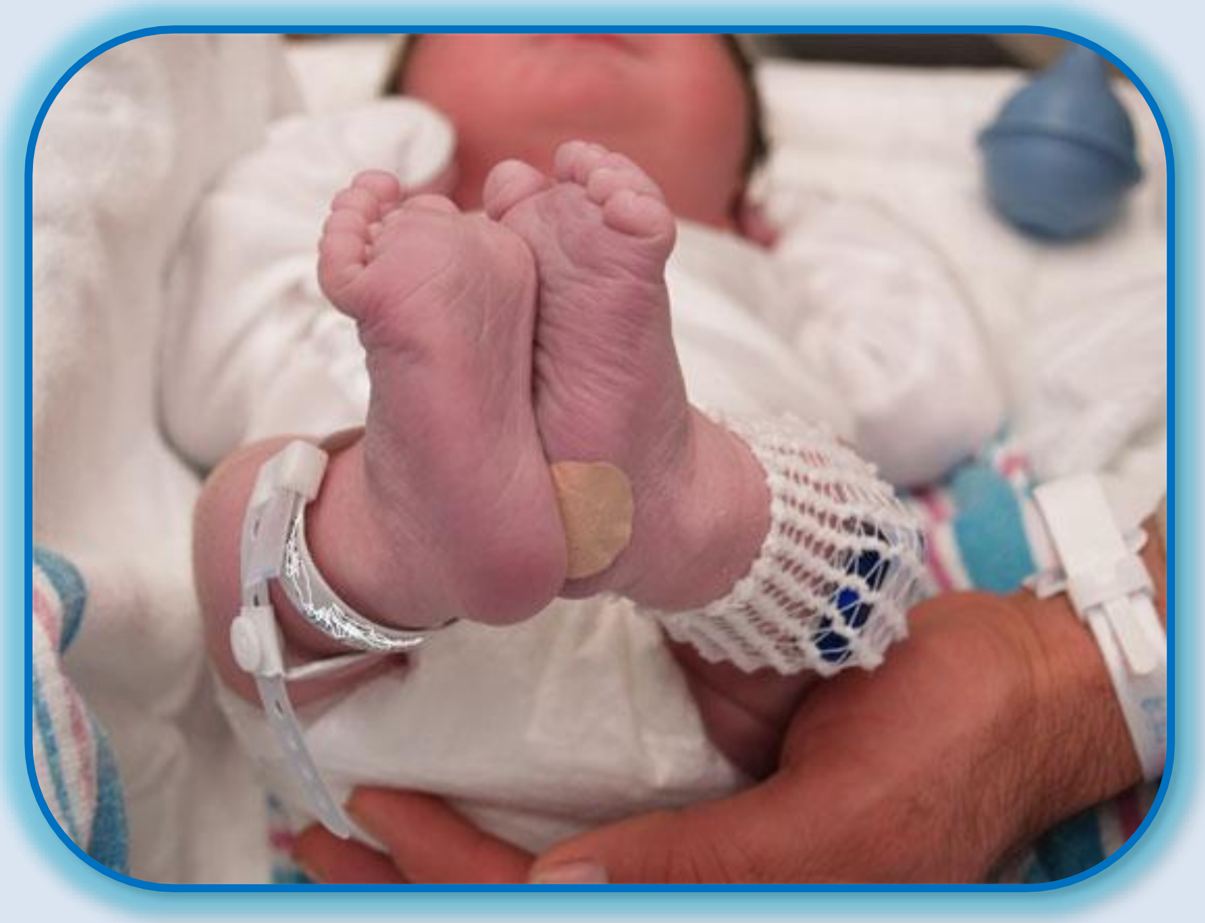
Note the contrast between the feet and the color of the right leg.

Acrocyanosis



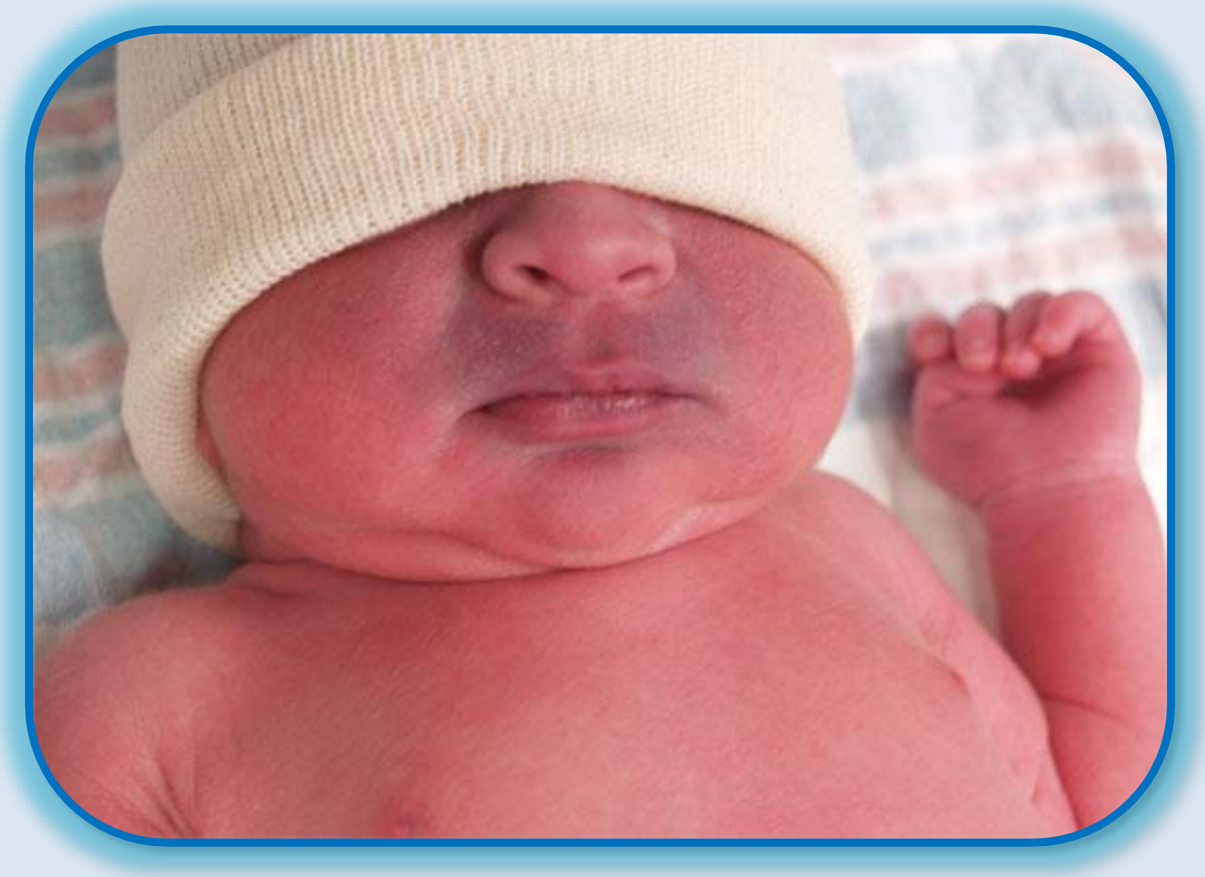
As this infant is **transitioning**, the blue color on the feet is starting to resolve over the upper part of the sole, but is still clearly present in the toes and, to a lesser degree, on the rest of the sole.

Acrocyanosis



Here again, the cyanosis of the feet is apparent in comparison to the parent's hand and the baby's chin.

Perioral Cyanosis

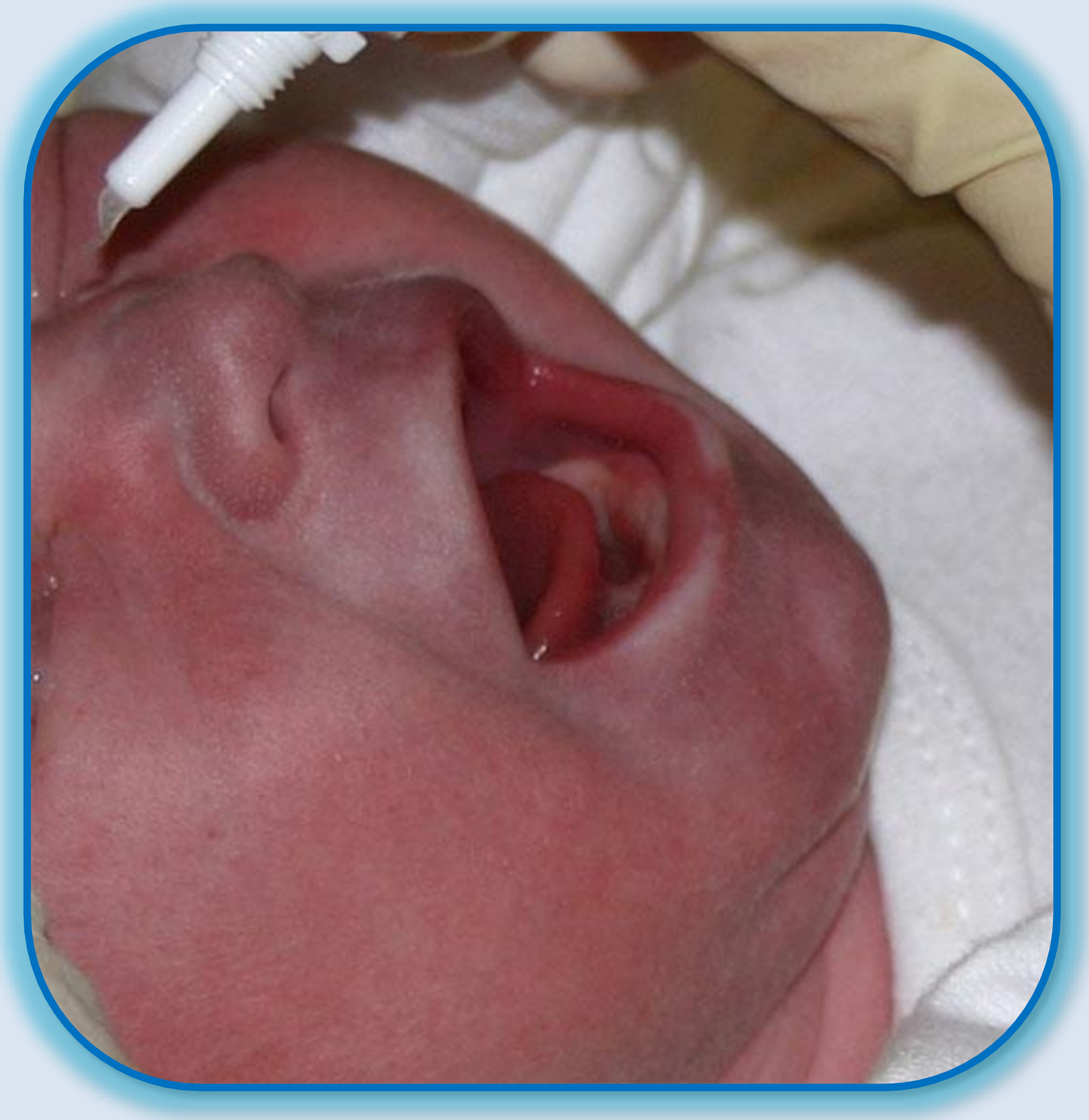


A blue color around the lips and philtrum is a relatively common finding shortly after birth. This is part of acrocyanosis.

The skin in this infant is visibly well perfused, and the tongue and mucous membranes in the mouth were pink, a finding that assures the examiner that central cyanosis is not present.

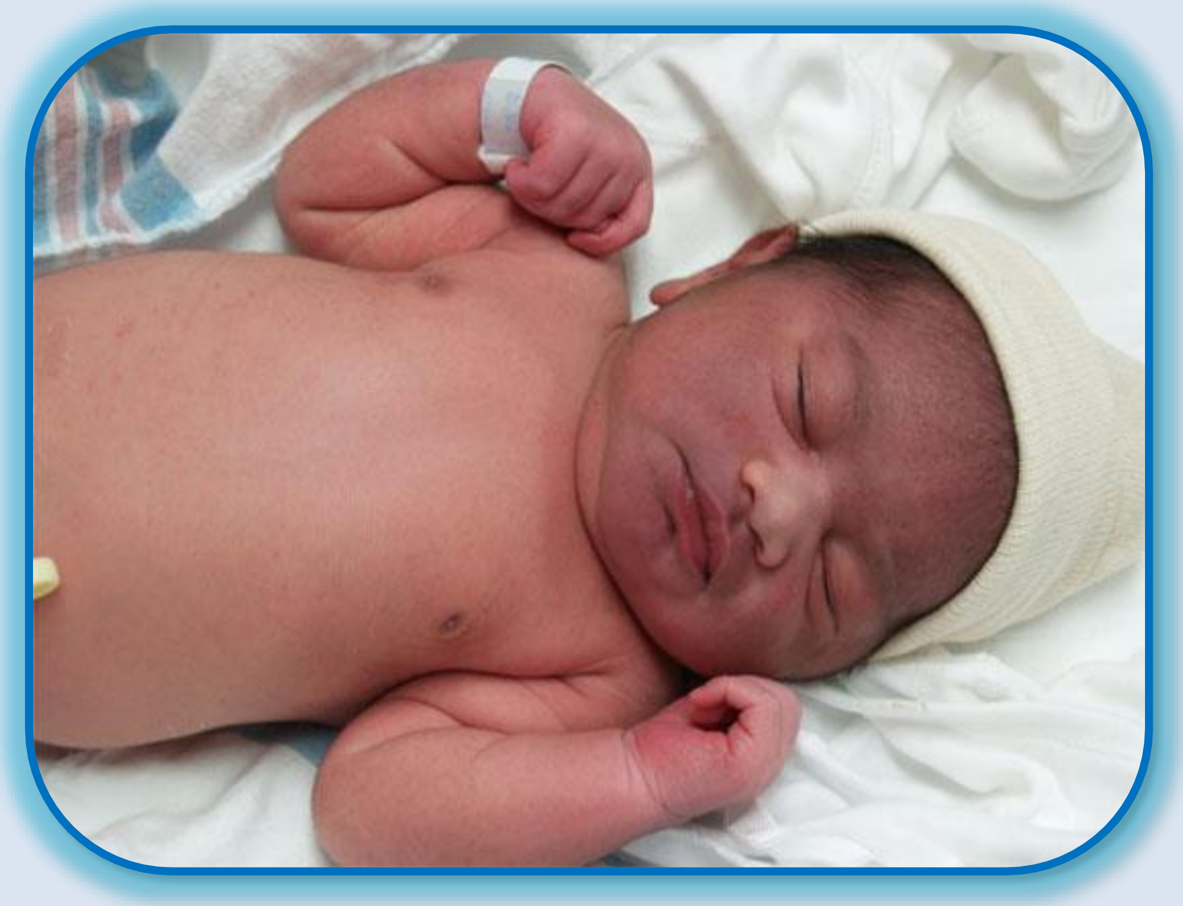
This finding resolved spontaneously over the next 48 hours.

Perioral Cyanosis



Another newborn with perioral cyanosis clearly demonstrates that although the philtrum and upper chin have a dark tint, the lips and tongue are bright pink.

Facial Bruising



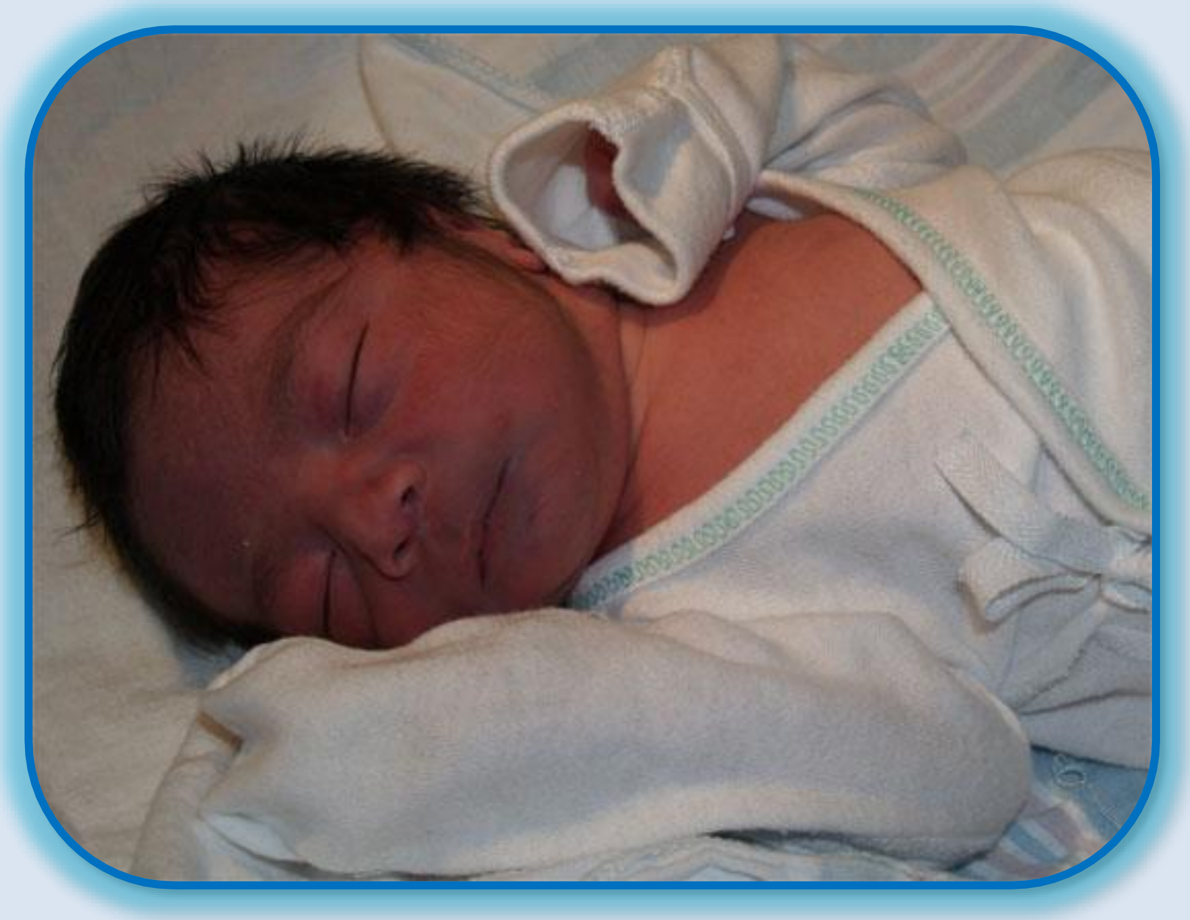
Marked bruising of the face can occur during delivery.

It is more common when there is a tight nuchal cord, **when the delivery is precipitous** or difficult, or when the infant is large.

When the infant is bundled, this facial appearance could be **mistaken for cyanosis**, but with a quick comparison to the color of the rest of the body, the diagnosis is obvious.

This type of bruising resolves over the course of several days.

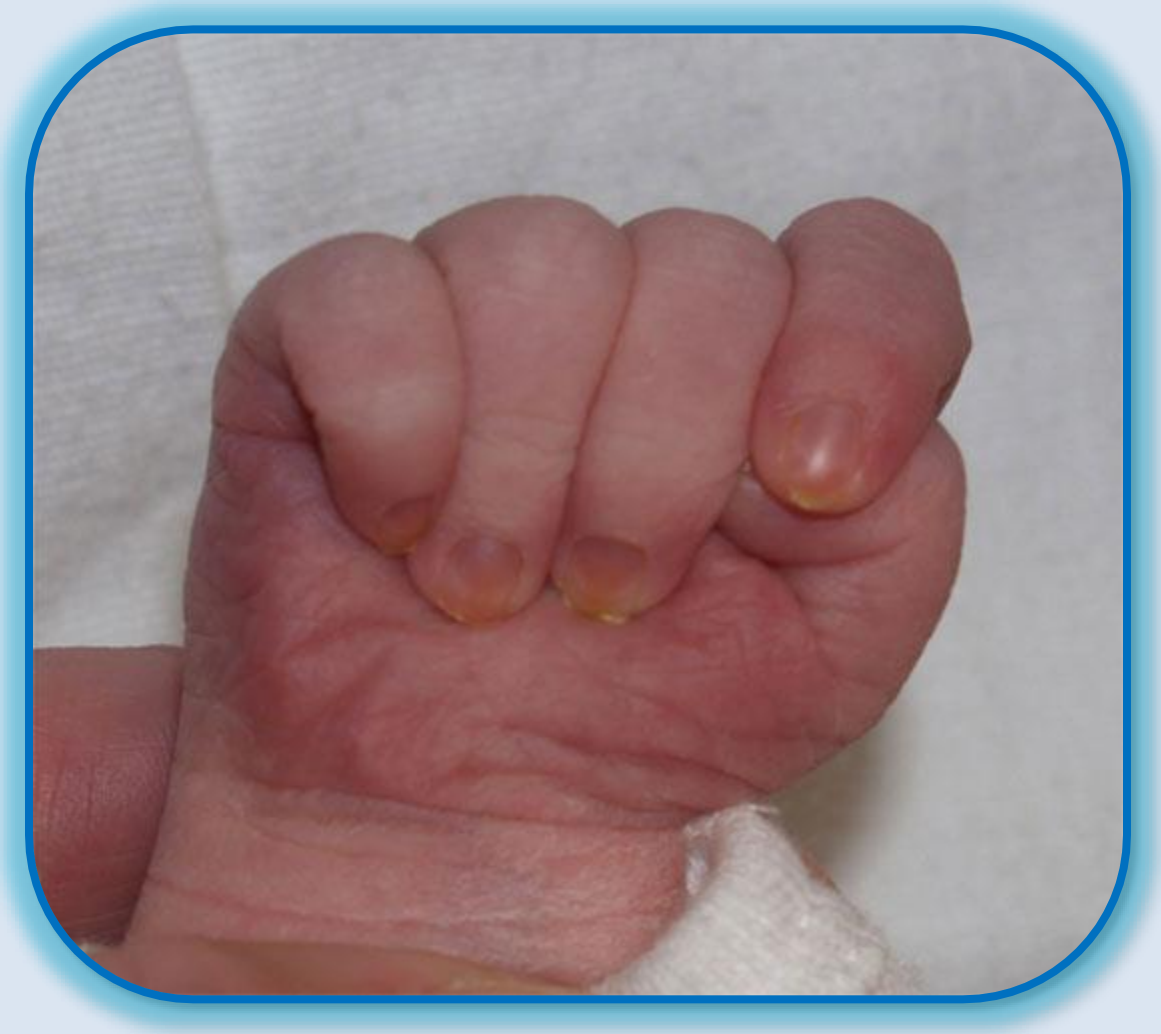
Facial Bruising



Here again the **face appears to be cyanotic** (including the lips), **but** the tongue and the rest of the body had a normal pink color.

On careful examination, **petechiae** where also noted across the forehead. This is another manifestation of bruising in a newborn; **no further evaluation is needed**.

Meconium Staining

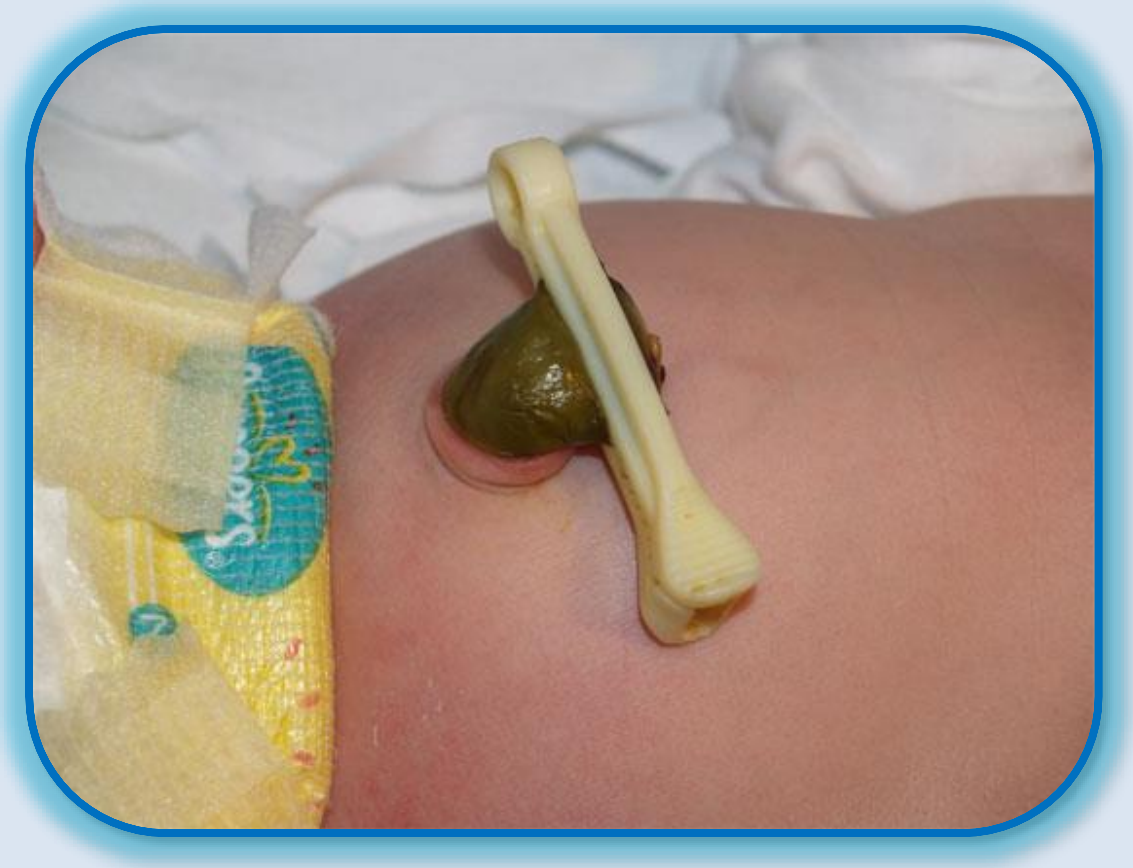


Evidence of meconium staining in utero may be a clue to an infant who was **stressed before birth**.

Meconium staining can be appreciated on the fingernails **(yellow tint)**. Normally, the nails are white. This suggests that the meconium was present in utero for some time prior to delivery.

Staining may also be seen on the umbilical cord and the skin.

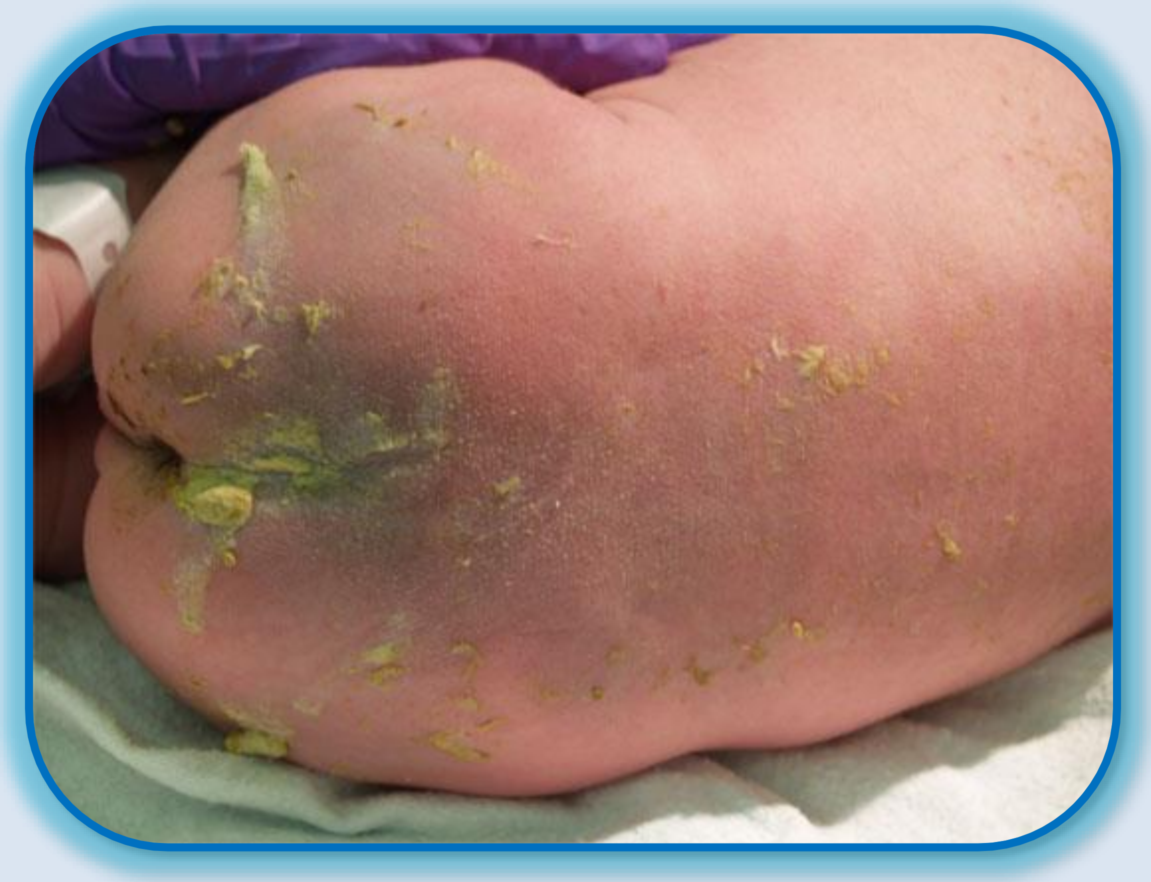
Meconium Stained Umbilical Cord



This cord is about 7 hours old, but the normal light yellow color is not visible, even though the cord is still plump. It is the presence of meconium in the amniotic fluid which gives it a dark green color.

Although meconium staining has no direct effect on the infant, the presence of meconium is often **associated with in utero stress**.

Meconium Staining

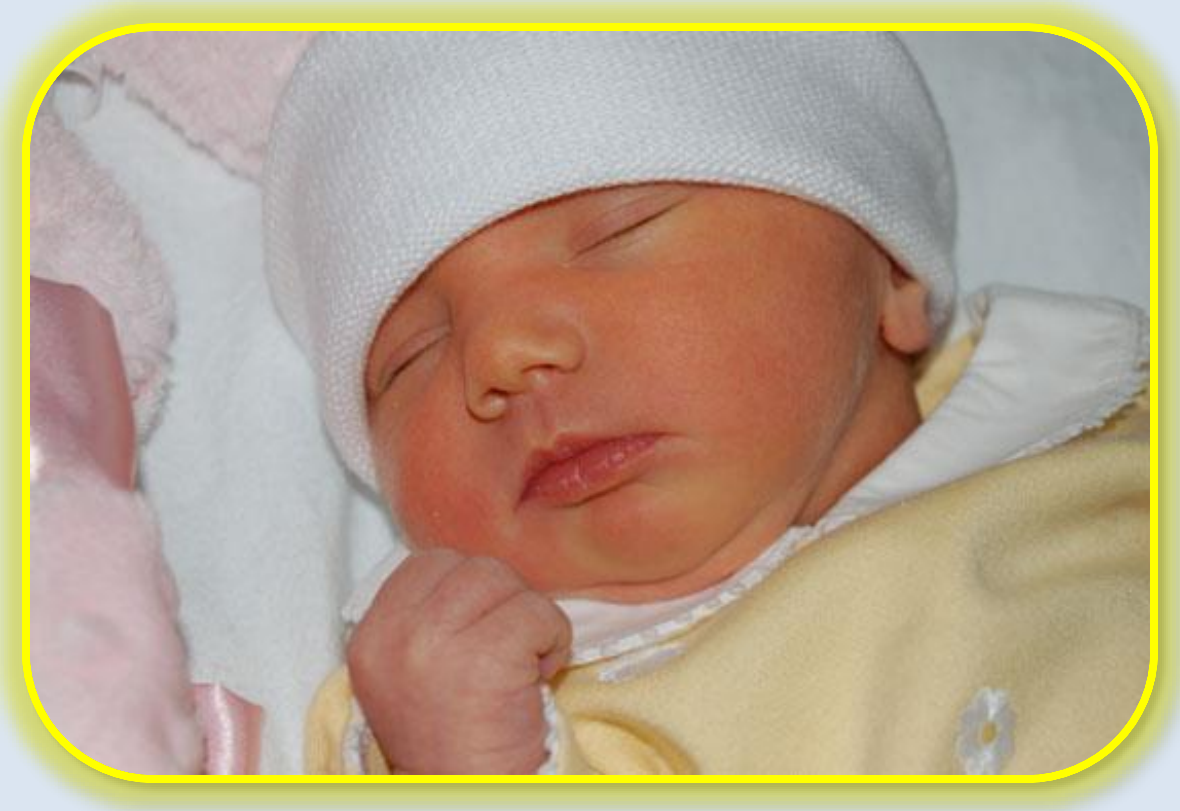


In this infant, it is not the skin itself, but the vernix that shows evidence of meconium in the amniotic fluid.

Vernix caseosa is the pasty, cheese-like, material present in varying degrees on the skin at birth. It is a mixture of sebum produced by the infant's skin and cellular debris that has accumulated in utero.

Normally, vernix is a creamy white color. The yellowish brown tint seen in this photo is a result of meconium staining.

Jaundice

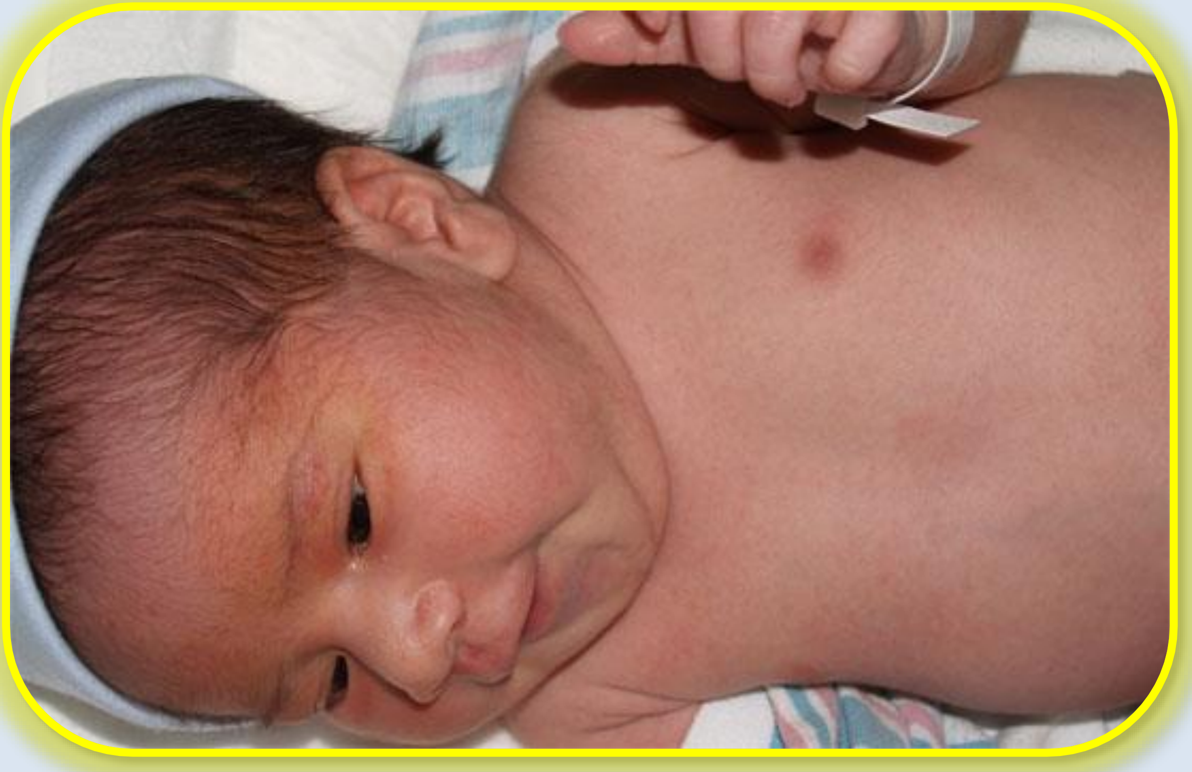


When assessing jaundice comparisons are useful.

Since the type of lighting in a room can dramatically affect the appearance of the skin, comparing the infant's color to the parents' color, or comparing the facial color of the infant to the color of the infant's feet can highlight differences.

If one is just looking at the face of this infant, the yellow tint might be thought to be the baby's skin tone. **Here the hand provides a nice contrast & much whiter.**

Jaundice

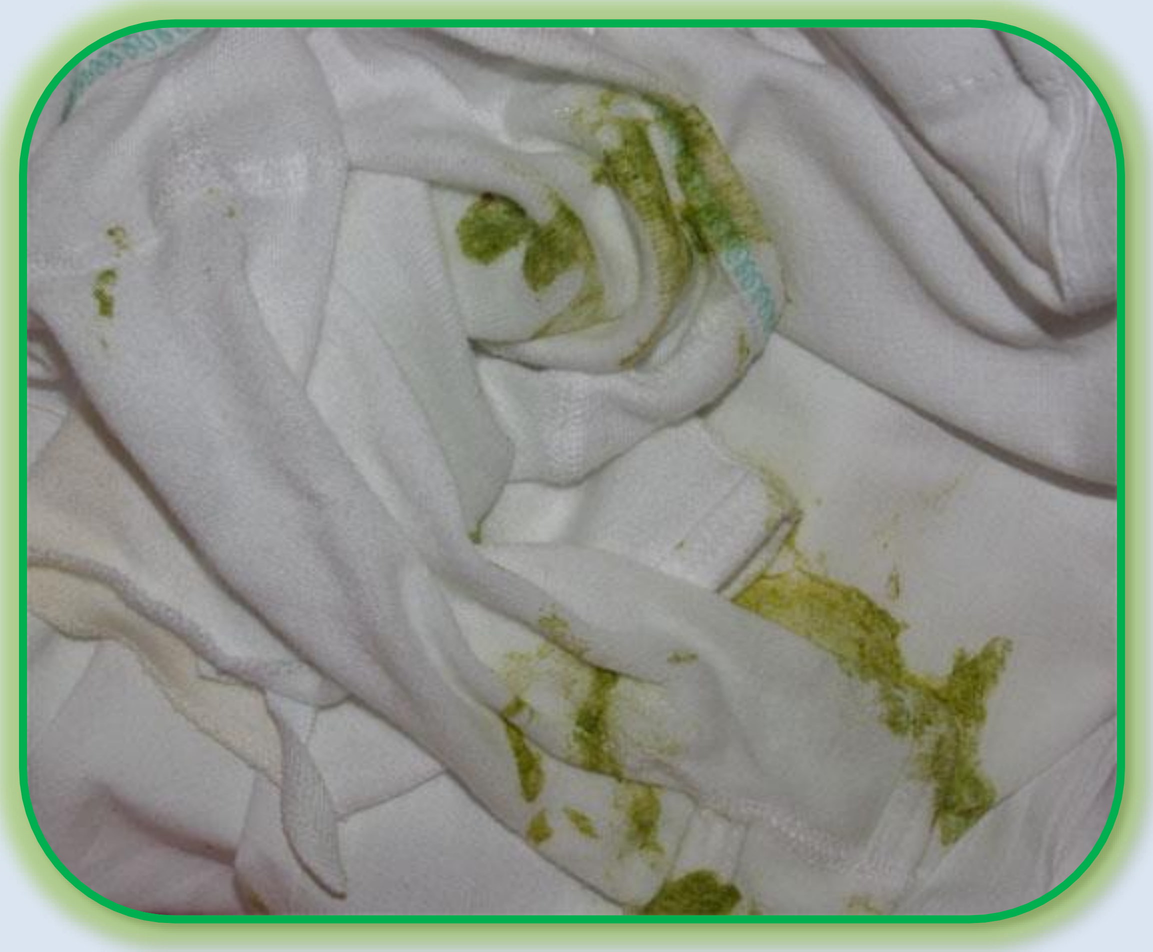


It is important for the examiner to understand that babies who are undergoing phototherapy treatment have an unreliable skin exam due to the **temporary "bleaching" effect of phototherapy on exposed skin**.

Here, minutes after the baby is removed from under the blue lights, a clear color demarcation can be seen between the skin that was under the eye cover and the skin that was exposed to the lights.

Serum bilirubins are the only useful measure of progress with phototherapy.

Bilious Emesis

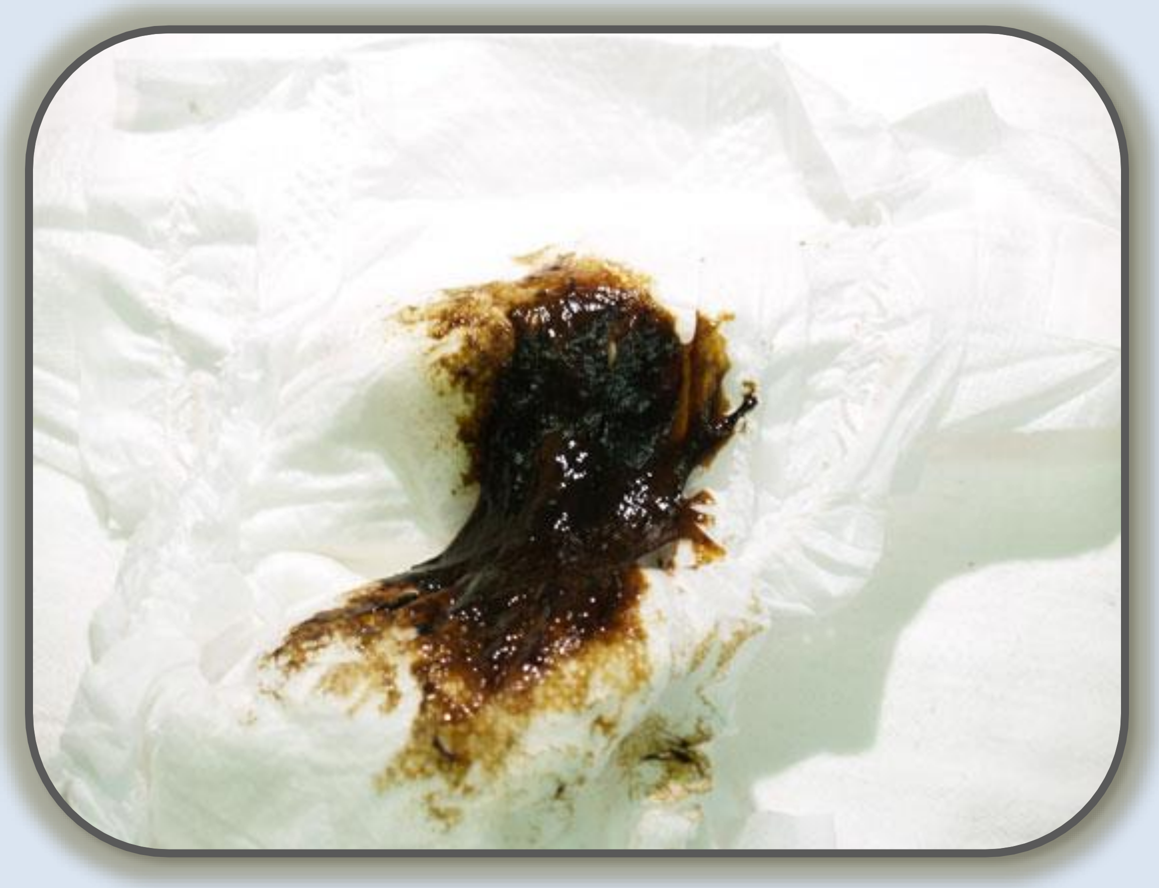


This is an example of bilious emesis (green color).

This newborn was thought to be well and was tolerating feedings for several days before the sudden onset of this abnormal emesis. **Malrotation with volvulus** was diagnosed and the infant underwent **emergent surgical correction**.

Emesis like this is never normal.

Meconium



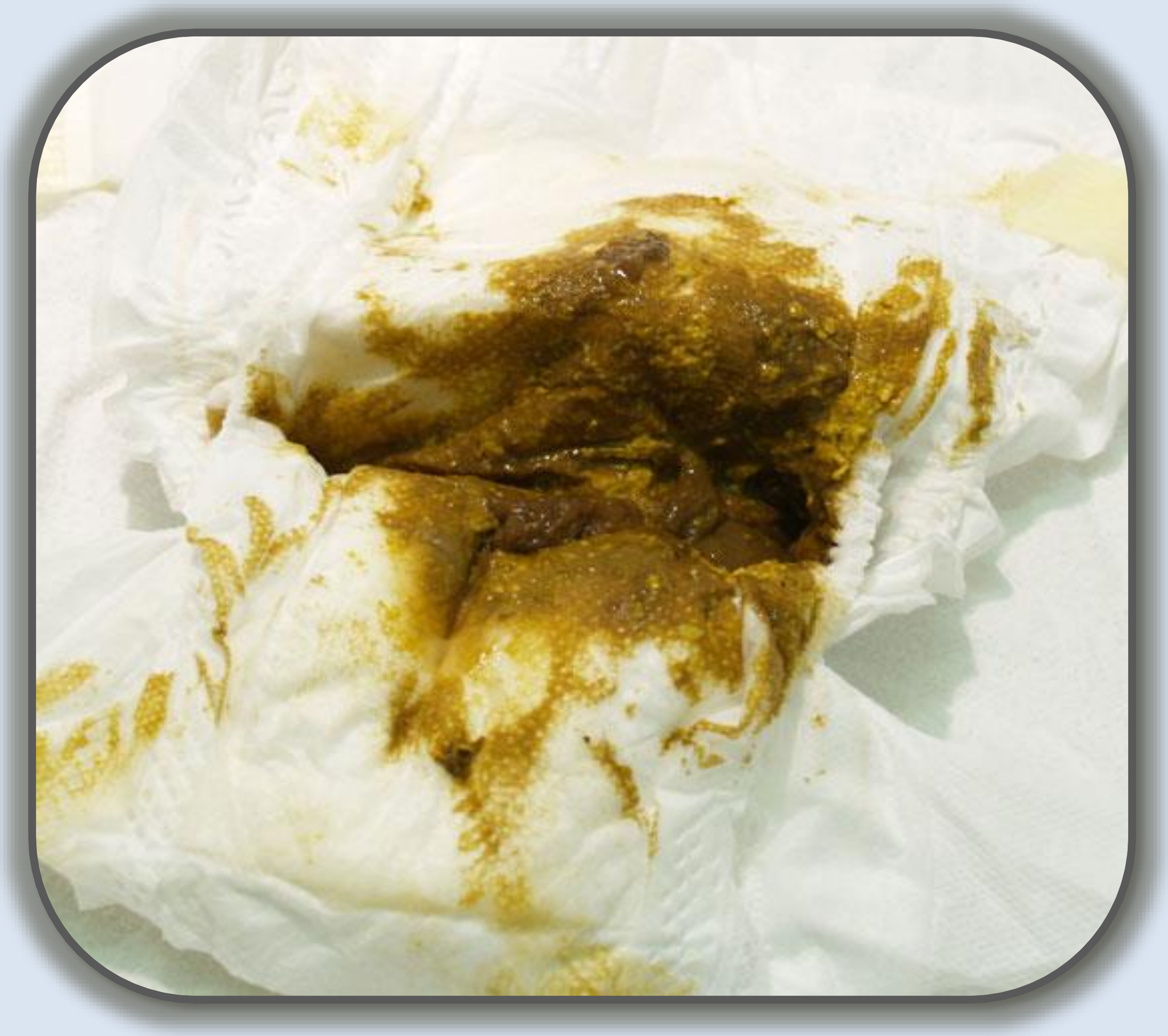
Meconium stools are characterized by their **dark** color (almost black), **sticky** consistency and **odorless** nature.

Normal passage of meconium should include at least **one stool in the first 48 hours** after birth and end with the onset of transitional stools by day 4.

Delayed passage of meconium should prompt consideration of **Hirshsrung's disease** or conditions associated with **meconium plugs**.

Delayed conversion to transitional stools should prompt evaluation of feeding adequacy.

Transitional Stool

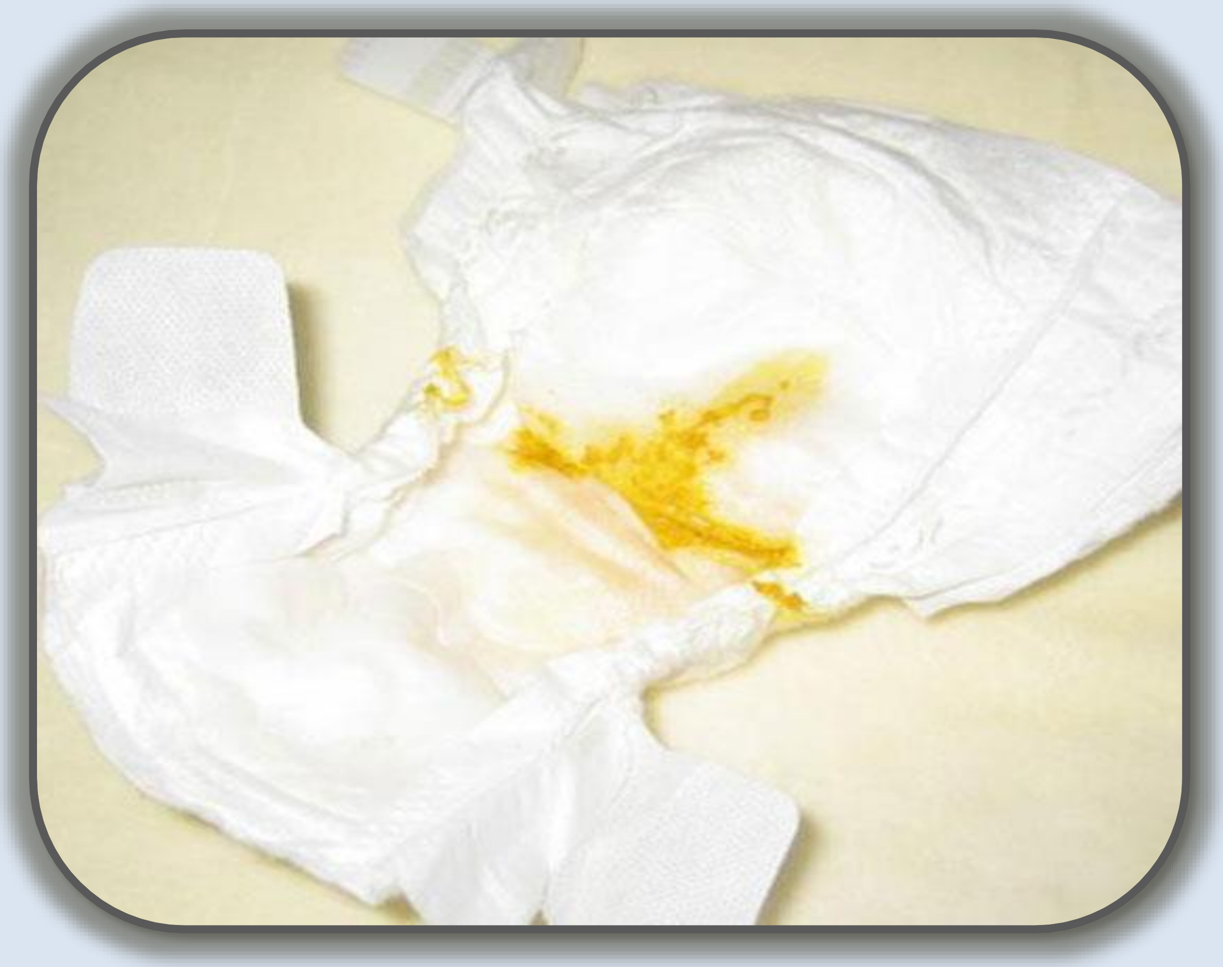


Transitional stool represents the change from meconium to the normal yellow, seedy stools that characterize infants feeding on milk only.

Here, the dark color of meconium is still visible, but lighter, yellowish curds can also be seen.

Exclusively breastfed infants should have transitional stools by day 4 if feedings are adequate.

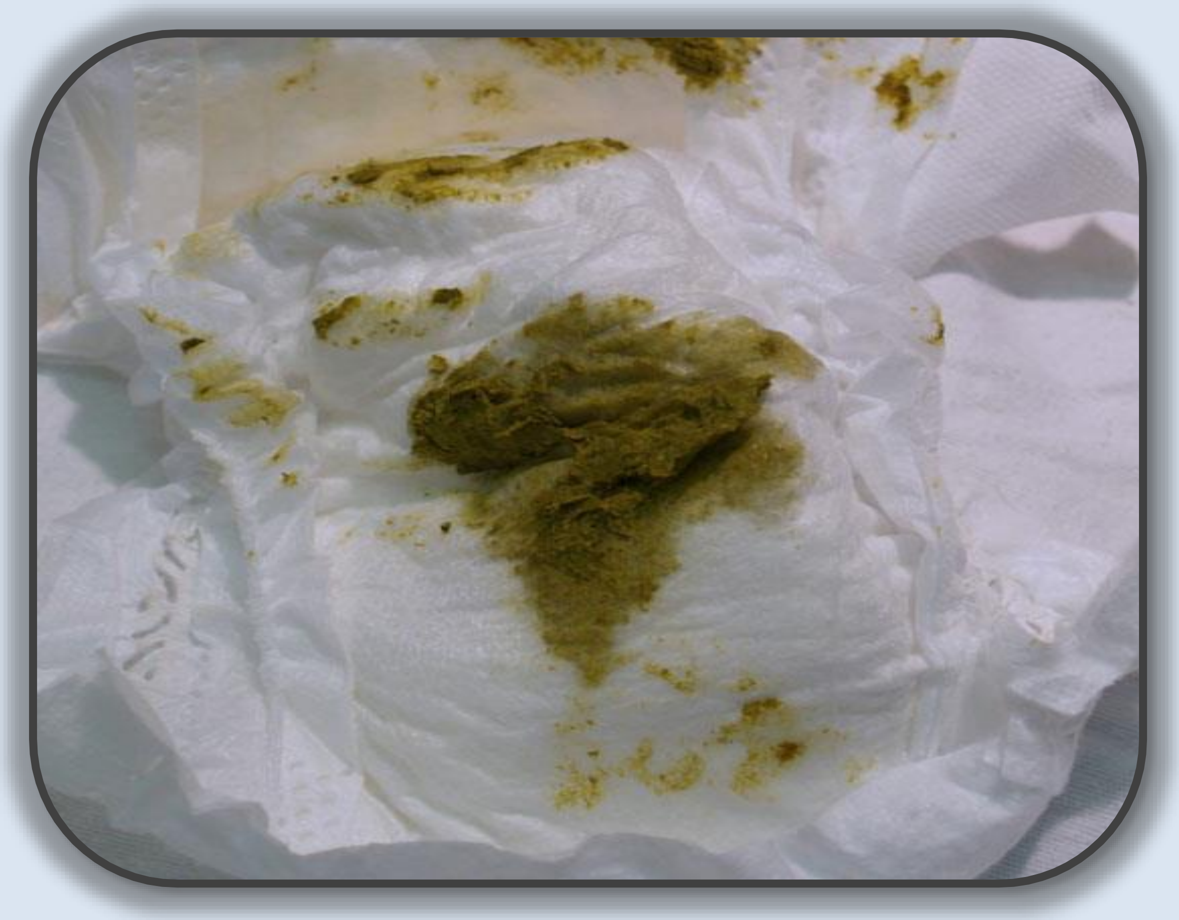
Yellow Stool



This is the normal appearance of stool in an infant who is exclusively breastfed. This appearance is typically described as **"bright yellow and seedy"**. Note there is a significant amount of liquid stool absorbed into the diaper with only some solid material on top. **This is sometimes thought to be diarrhea by parents, but it is not**.

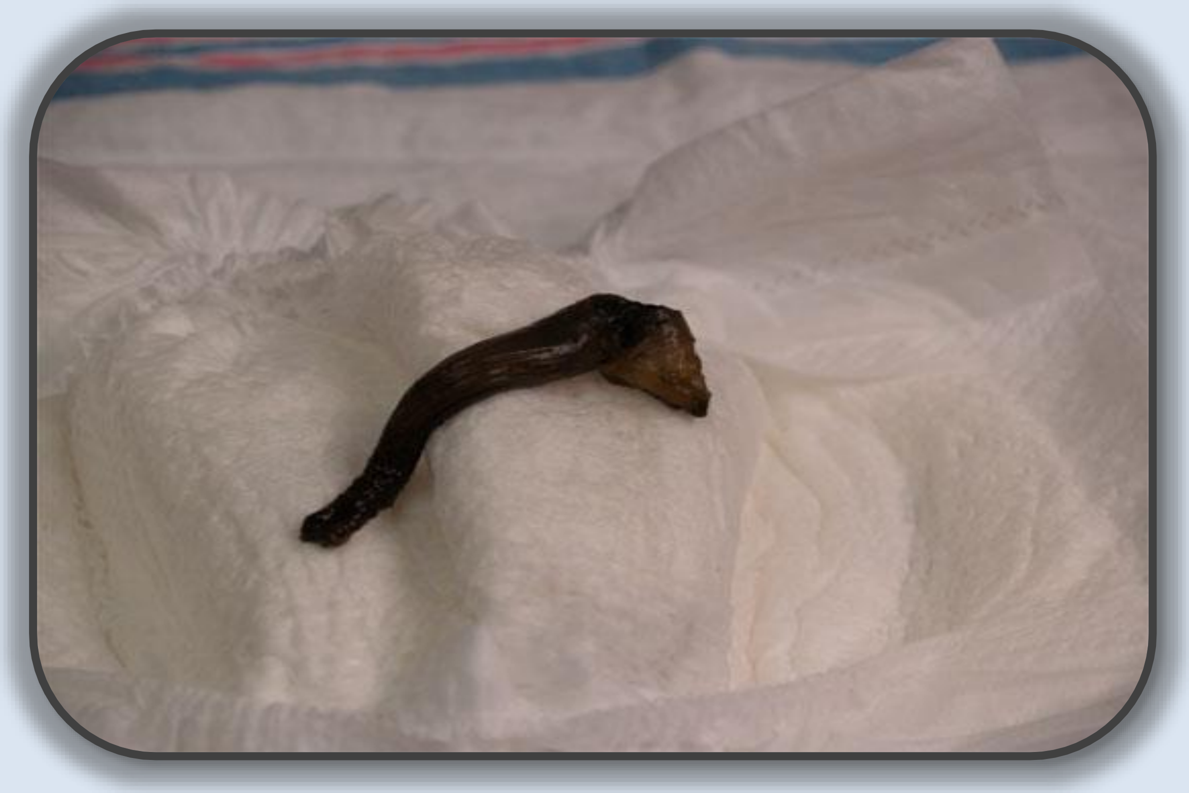
The presence of this type of stool **by day 5** is a reassuring sign that the infant is being well fed.

Normal Stool



This is the stool of a 2 week old infant who was being fed an extensively hydrolyzed formula. The stool is normal, but has less of the bright yellow, seedy consistency of a breast-fed infant stool.

Meconium Plug



Here is an example of a stool that is **not normal**. This is a meconium plug. It is a **very viscous**, **congealed mass** of meconium that may either be spontaneously passed or **may create an obstruction** and be the cause of delayed passage of stool. Typically, after the infant passes the plug, the subsequent stool is normal.

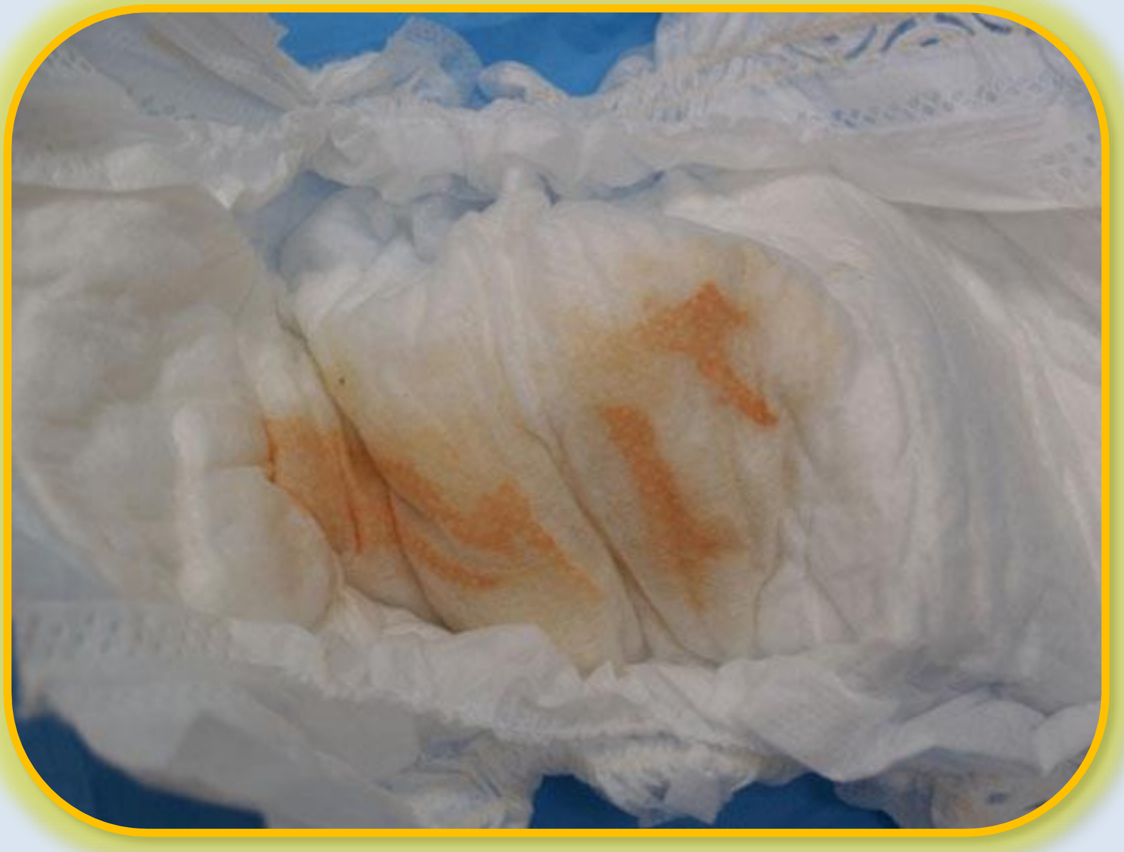
Although there is a known **association** between an underlying diagnosis of **cystic fibrosis (CF)** and meconium plug, many infants with this finding do not have CF.

The majority of cases are thought to be caused by an **immaturity of the ganglion cells** of the colon, leading to a transient impairment of colonic function. **Maternal diabetes and prematurity are known risk factors**.

Normal Urine

Normal urine soaked into a diaper. Because of the absorbency of disposable diapers, the surface will not feel wet, even with this considerable amount of urine. **If knowing output is important, dry and wet weights of the diaper can be measured.**

Urate Crystals



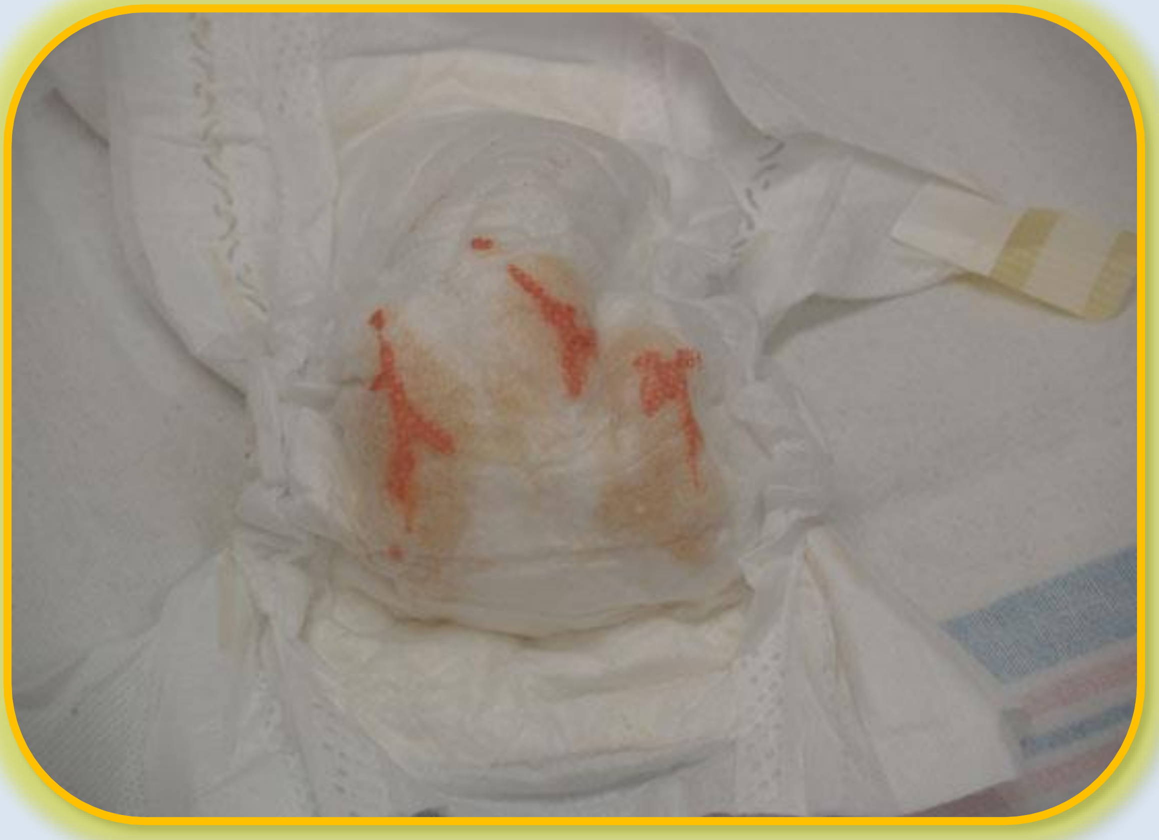
Often mistaken for blood in the urine.

Urate crystals are a frequent intermittent finding in the **first week**.

The characteristic appearance of **pink-orange** material is sufficient to make the diagnosis.

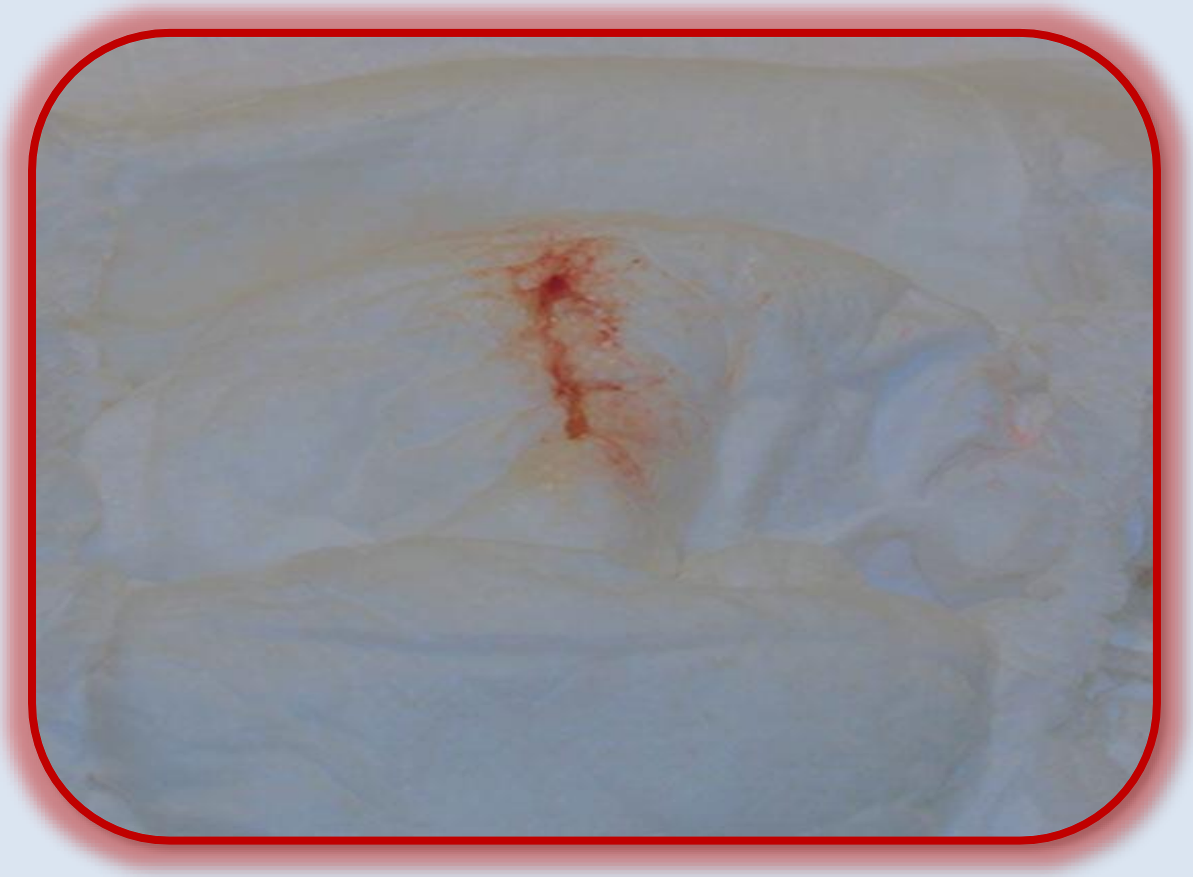
No laboratory analysis is needed.

Urate Crystals



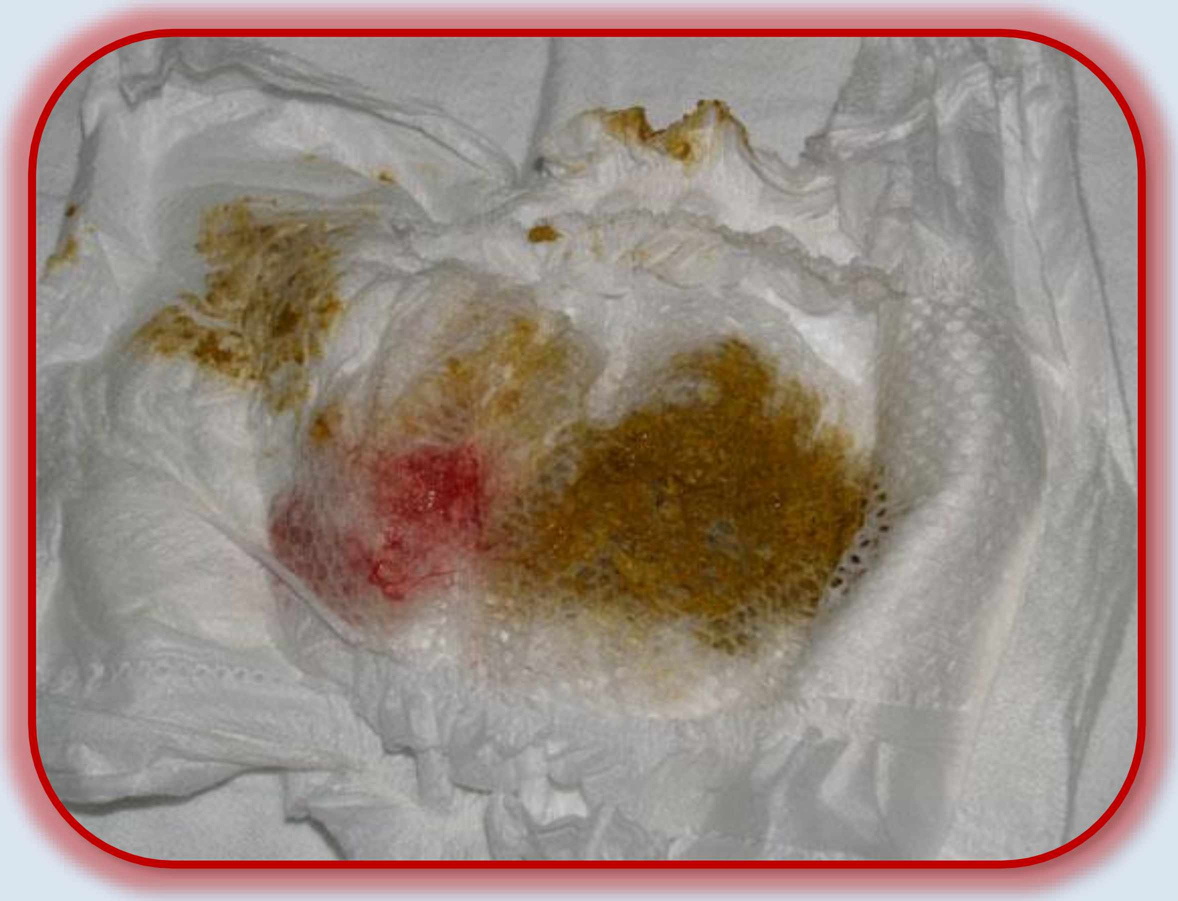
Another example of urate crystals in a diaper. Even in the urine-soaked areas, a pink tinge is visible.

Normal Vaginal Blood



This is normal vaginal withdrawal bleeding that occurs in some female infants. Similar to withdrawal bleeding in adolescents, this **typically occurs on the third day after birth**, continues for a few days & then stops.

Normal Vaginal Blood

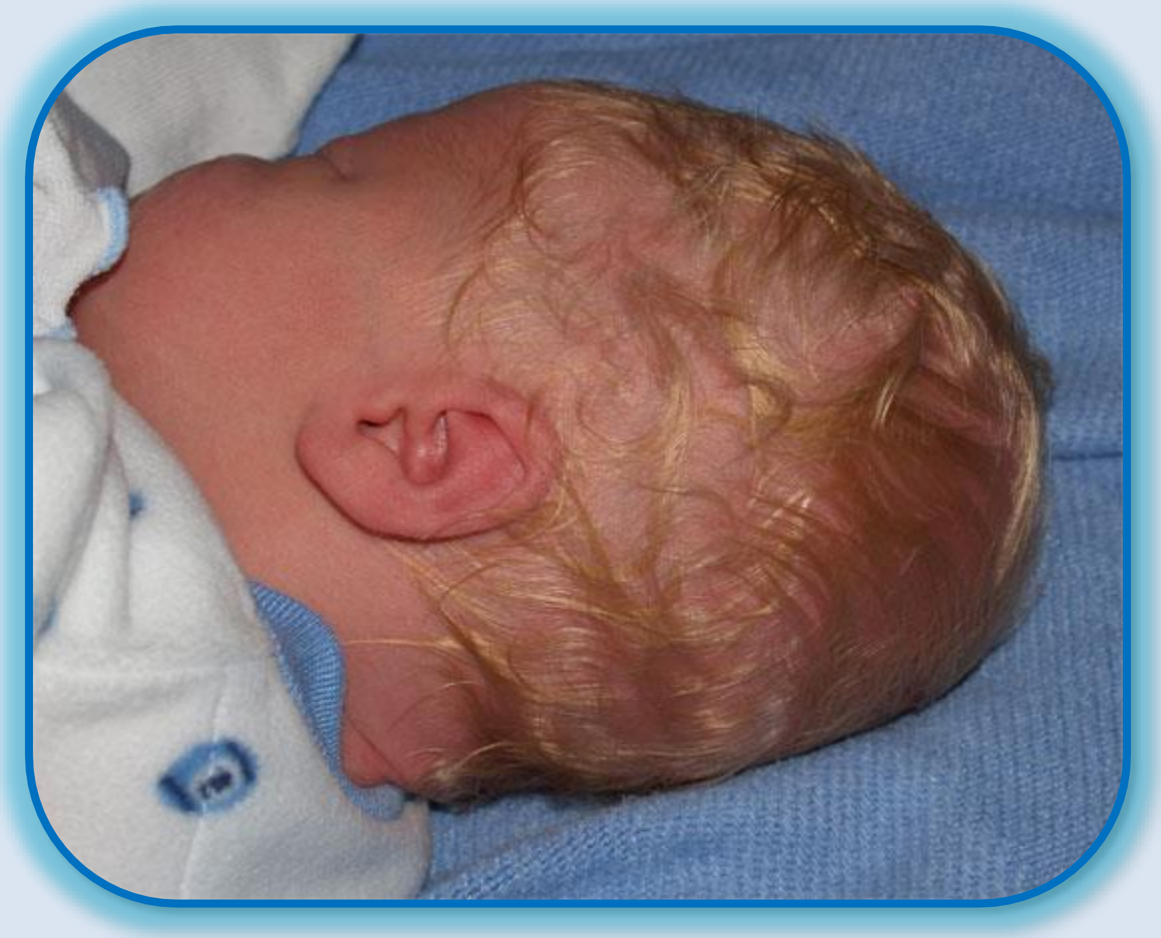


Here is another example of normal vaginal withdrawal bleeding in a newborn girl. For the first 3 days, no blood was noted. This photo was taken of a diaper produced on day 4. On physical exam, blood could be seen in the vaginal area, but was otherwise normal. Bleeding may be noted in every diaper for a couple of days, but will **spontaneously resolve**.

Large amounts of blood are not normal for withdrawal bleeding. If bleeding seems excessive, vitamin K deficient bleeding or other coagulopathy should be considered.

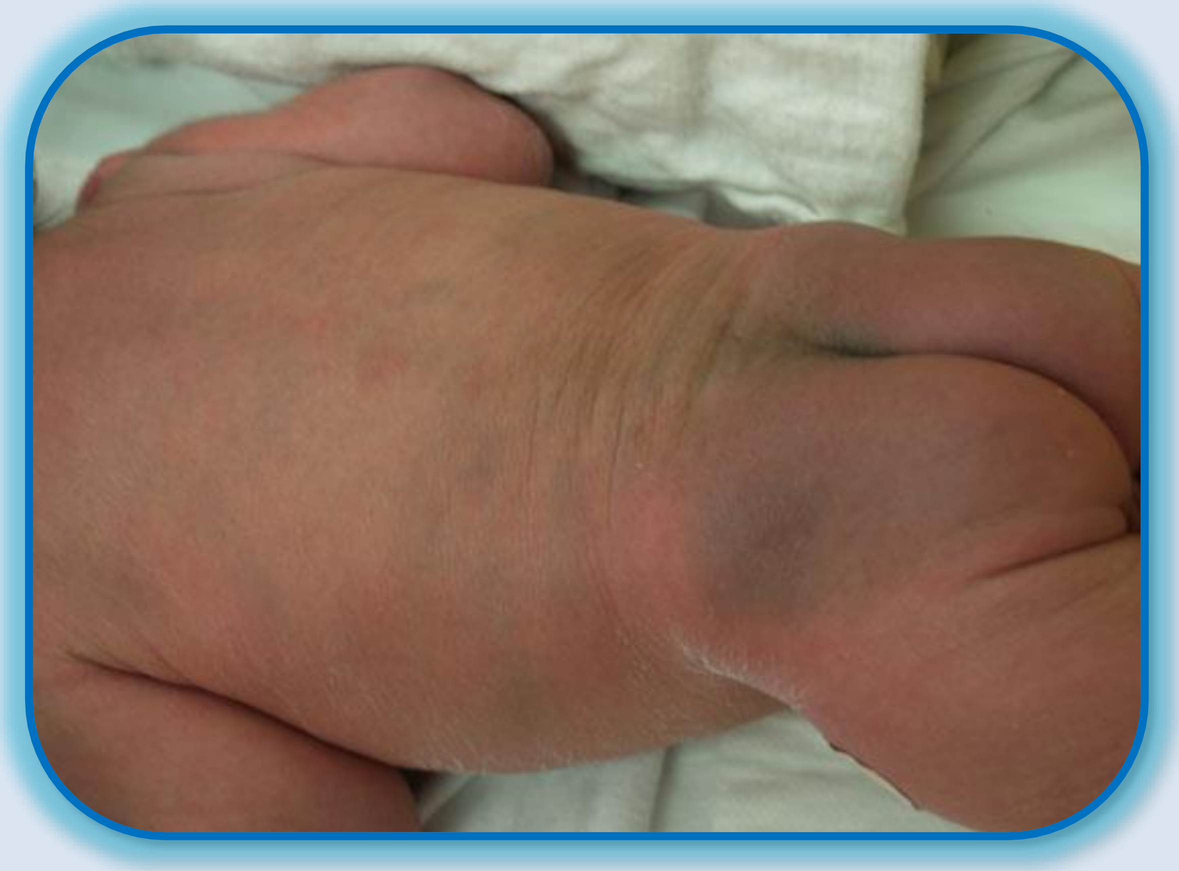
Skin

Albinism



Although the pediatrician's physical examination was unremarkable except for the general hypopigmentation, eye findings consistent with oculocutaneous albinism were noted by the ophthalomologist. These included transillumination of the irises, blonde fundi and vessels running through the macula. Nystagmus was not present at birth, but may be present in this condition as visual acuity is often low.

Slate Grey Patches (Mongolian Spots)



These **dark blue-grey** lesions are most commonly seen in darker skinned infants.

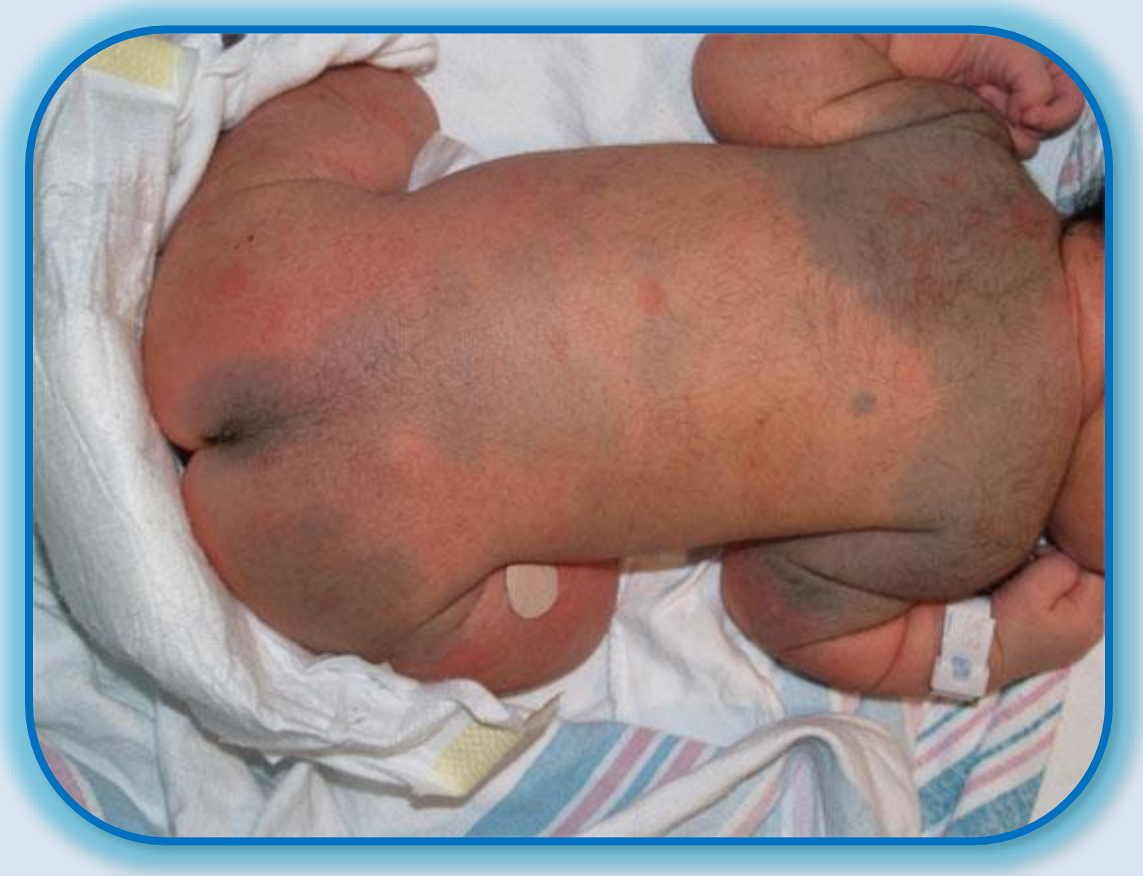
The **sacrum** is the **most commonly** affected area.

These lesions tend to **fade over several years** but **may not** completely disappear.

No evaluation is needed.

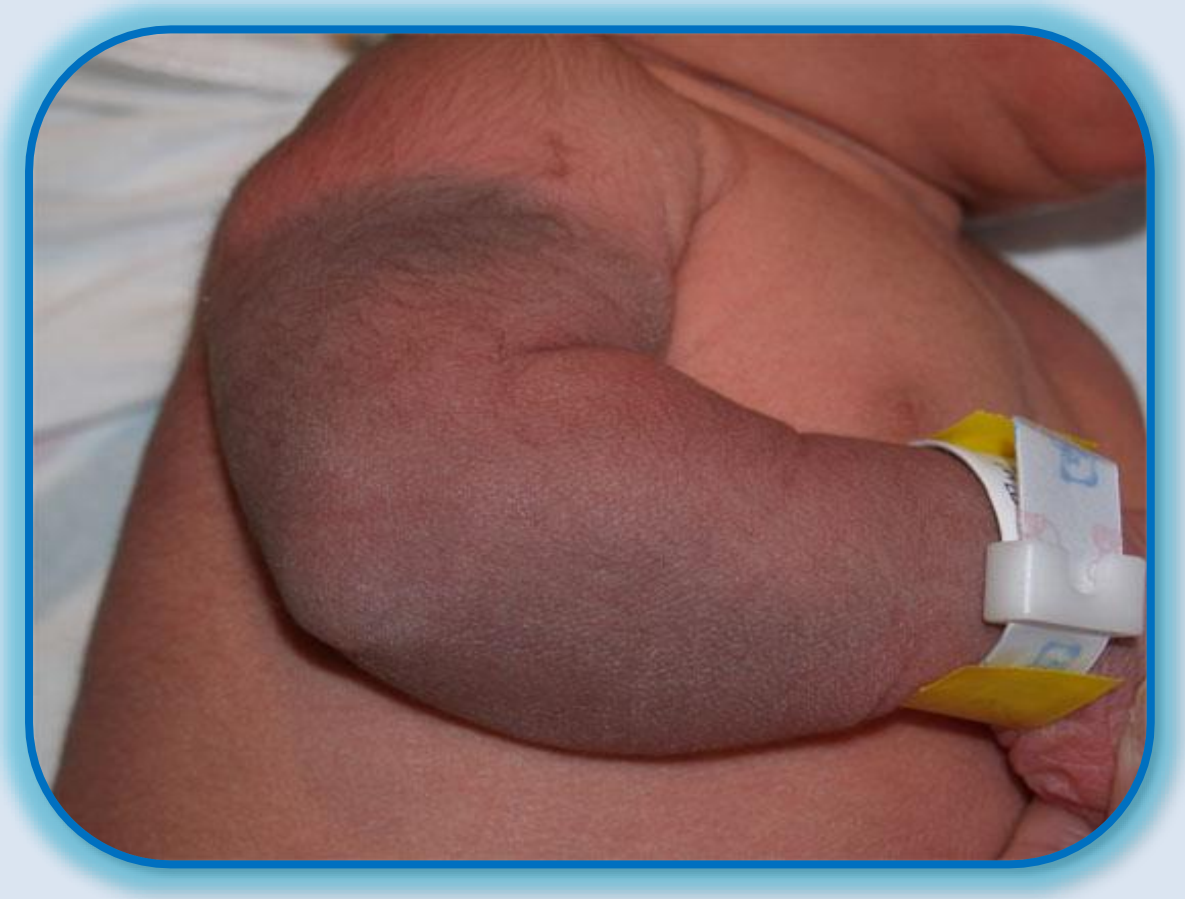
They can be easily differentiated from bruises by the absence of other colors associated with bruises (red, purple, green, brown or yellow).

Slate Grey Patches (Mongolian Spots)



This baby has more intense and widespread lesions.

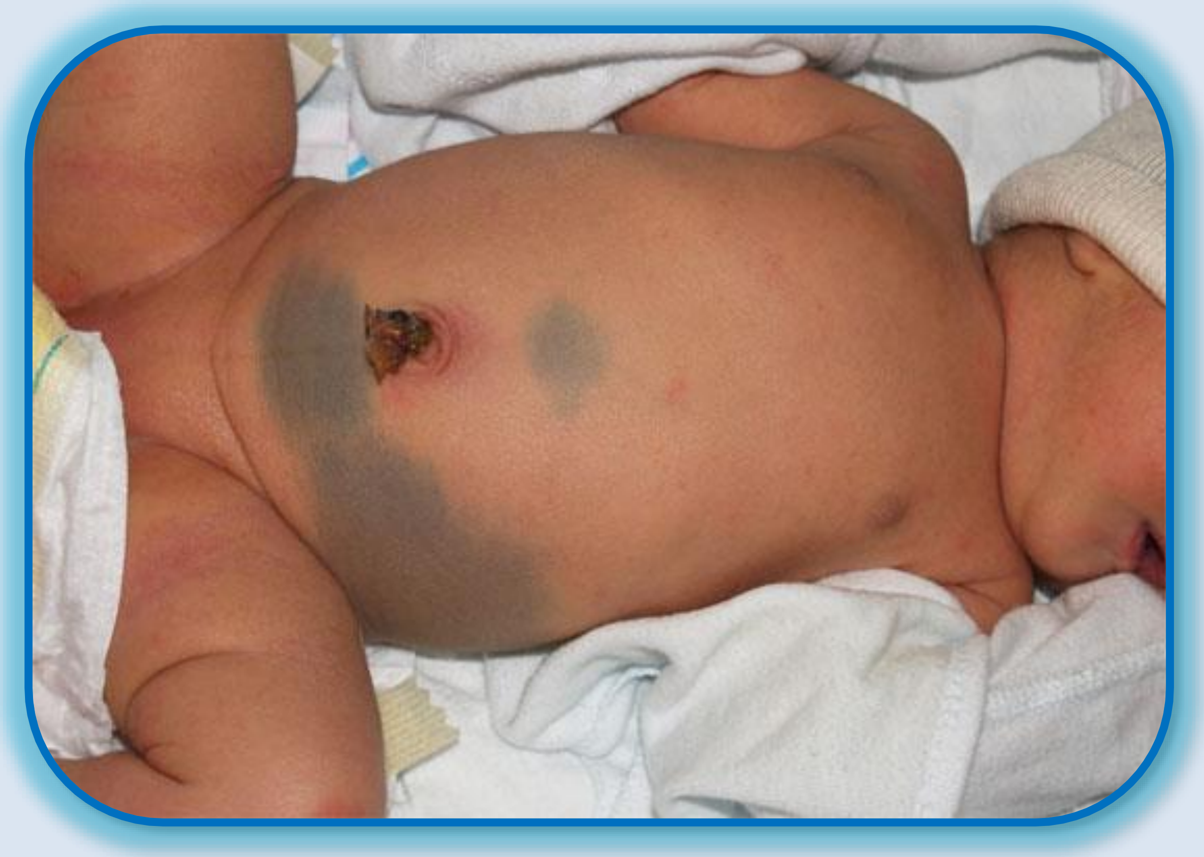
Slate Grey Patches (Mongolian Spots)



Slate grey patches can even involve an entire extremity. It is important to be able to **distinguish** the typical appearance of the patch even in an unusual location, so that **trauma** is not suspected.

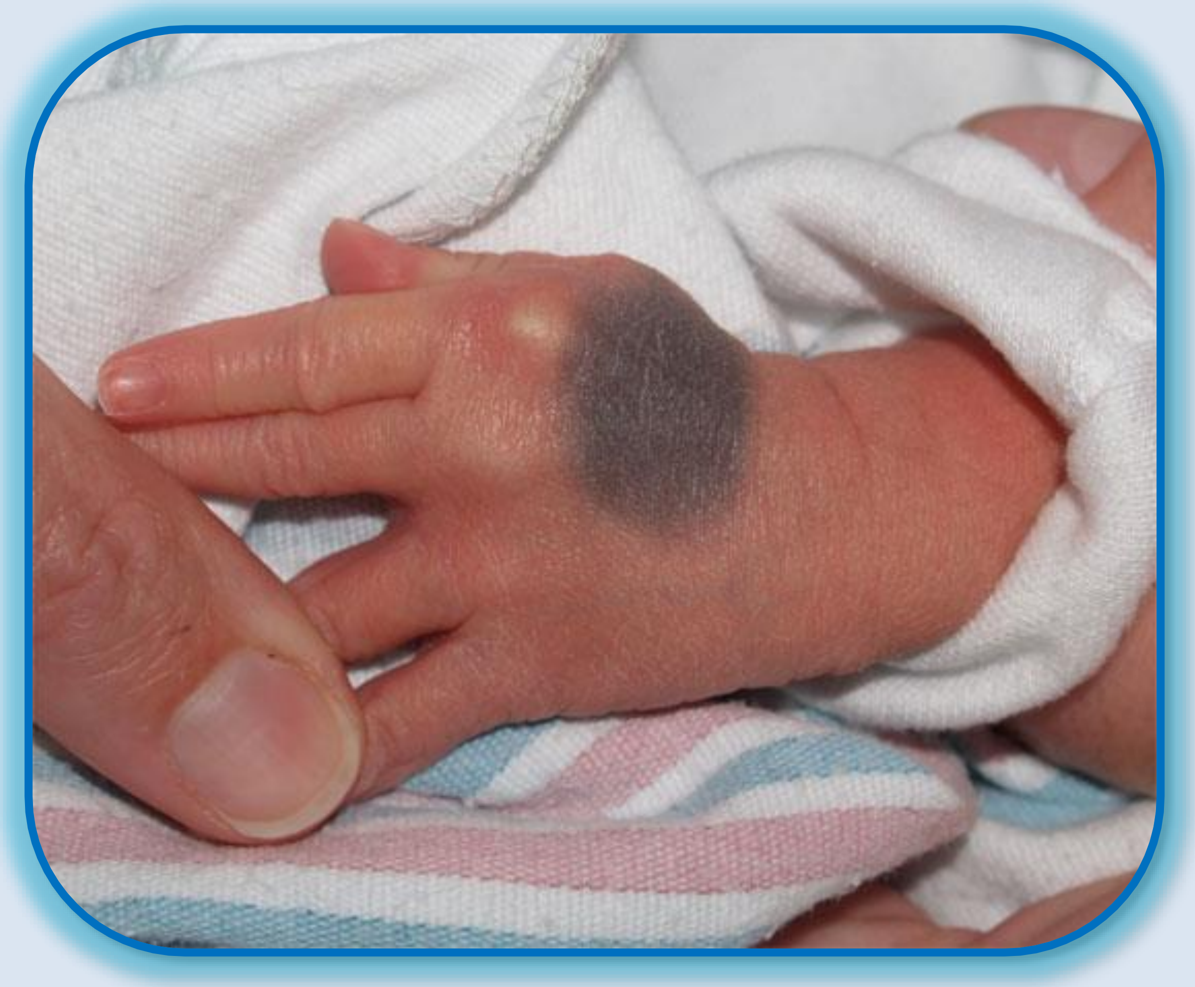
Patches involving a single leg or which are circumferential around both ankles can also be seen. **Documentation** of these unusual birthmarks in the medical record is helpful.

Slate Grey Patches (Mongolian Spots)



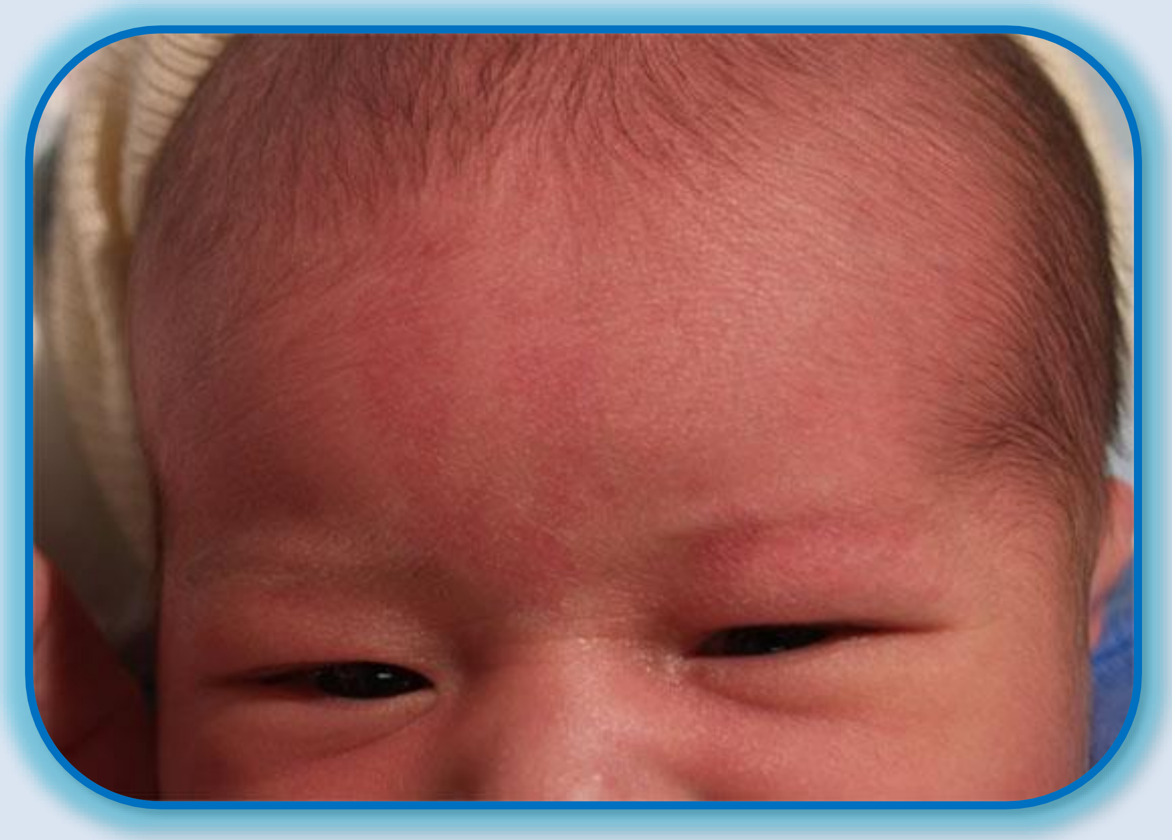
This is another **atypical** example. These slate grey patches are **typical in appearance, but unusual in location**, as this finding is almost always observed on the back or extremities.

Slate Grey Patch (Mongolian Spot)



This photograph was taken approximately 6 hours after birth. In this case, the infant was initially thought to have sustained a bruise from delivery because this hand presented in a position on top of the head. The homogenous appearance and discrete borders, though, are inconsistent with a fresh bruise.

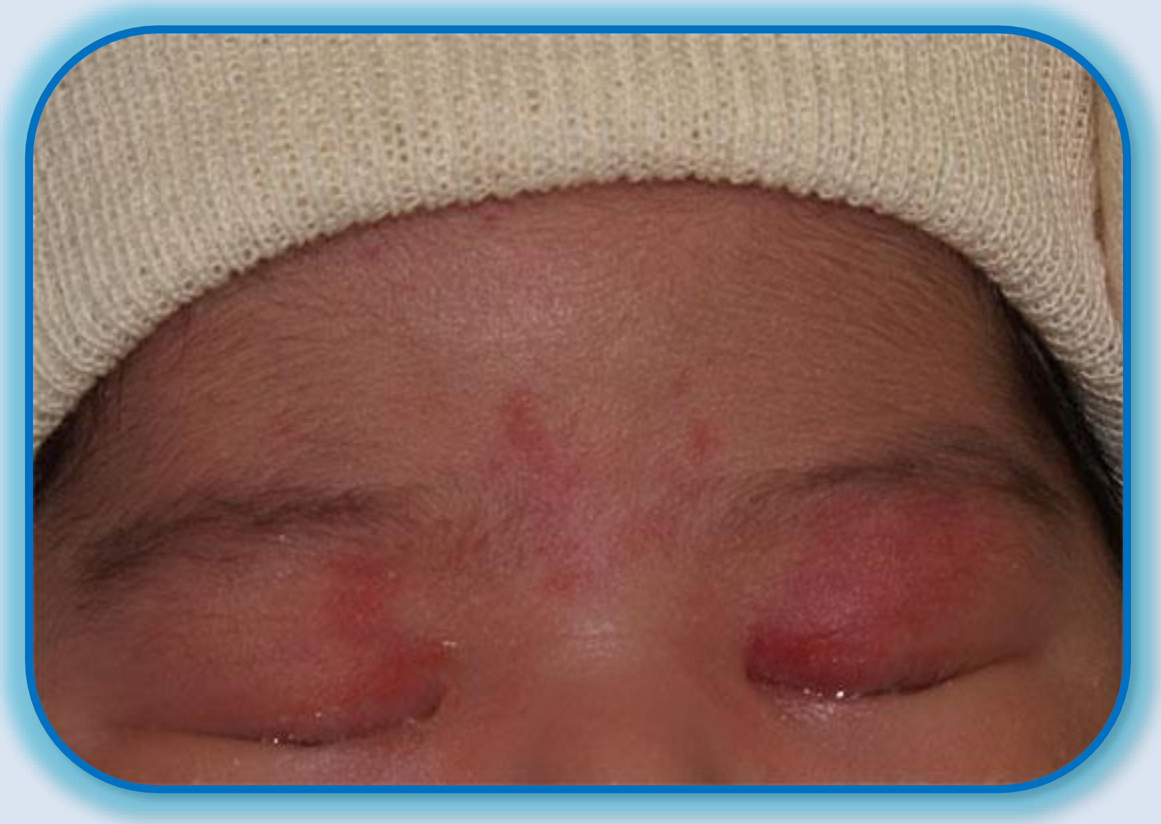
Salmon Patch



The **pink patches** in the middle of the forehead and over the left eye are salmon patches. Also known as nevus simplex or **"angel kisses"**, these are common **capillary malformations that are present at birth**.

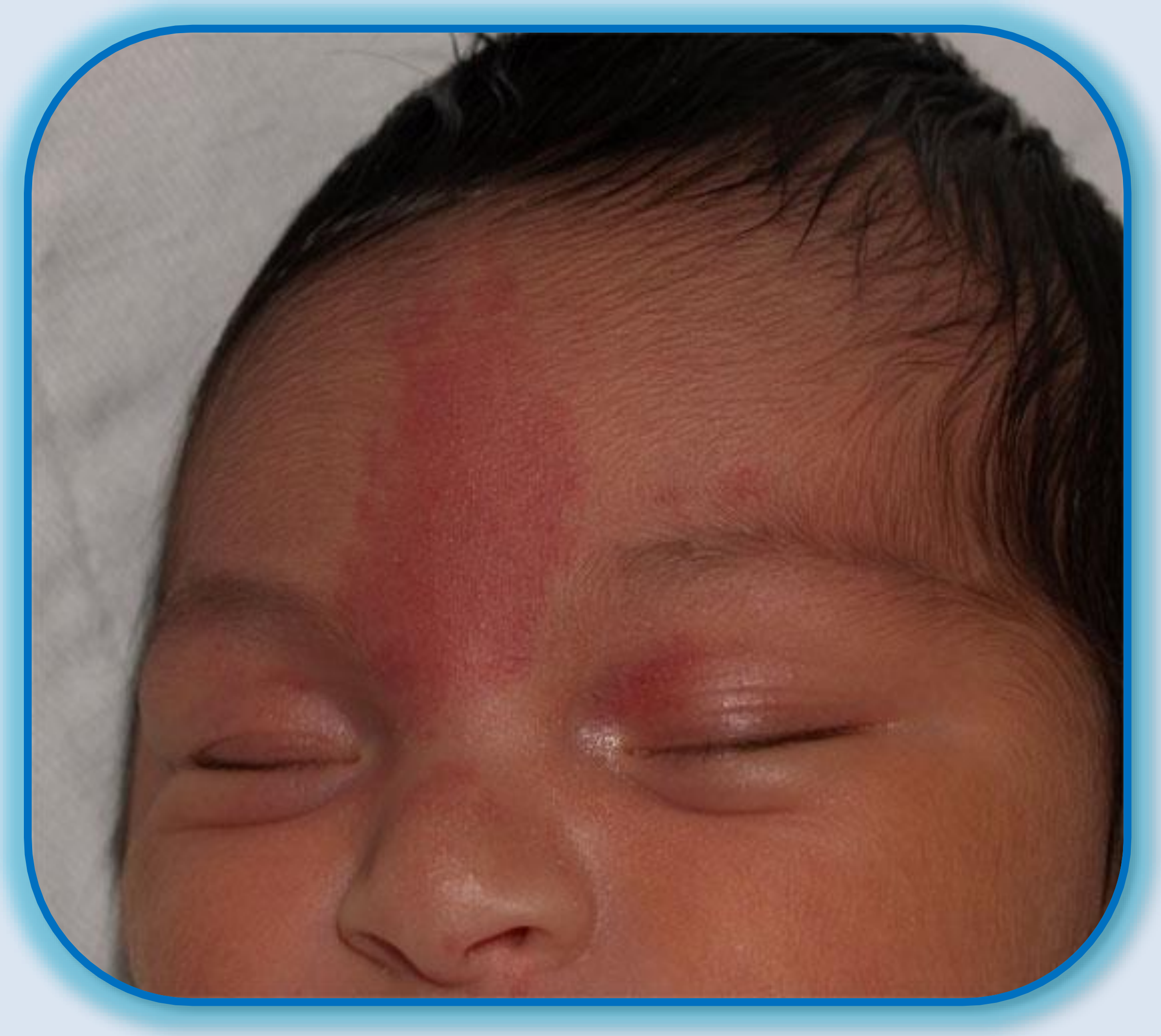
Eyelid spots generally **fade over** several months. Lesions on the glabella may take several years to resolve, and occasionally the outlines can be seen into adulthood, especially when the face is flushed.

Salmon Patch



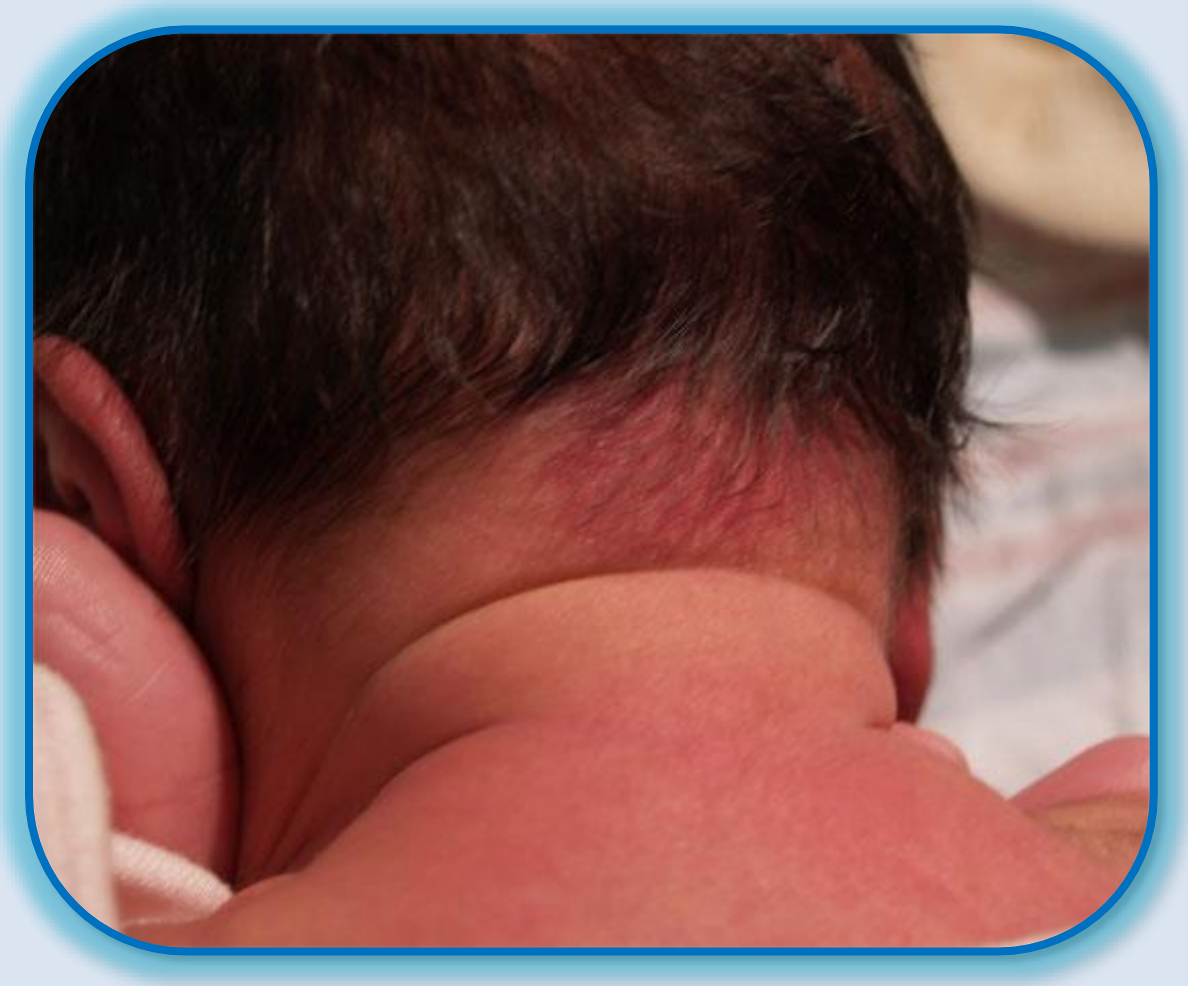
When lesions are present only on the eyelids, they are sometimes **mistaken for bruising**, but the examiner should realize that the eyelids are in a much protected position. Although the lids may be quite edematous, bruising in this location would be highly unusual, even in a baby with bruising elsewhere on the face.

Salmon Patch



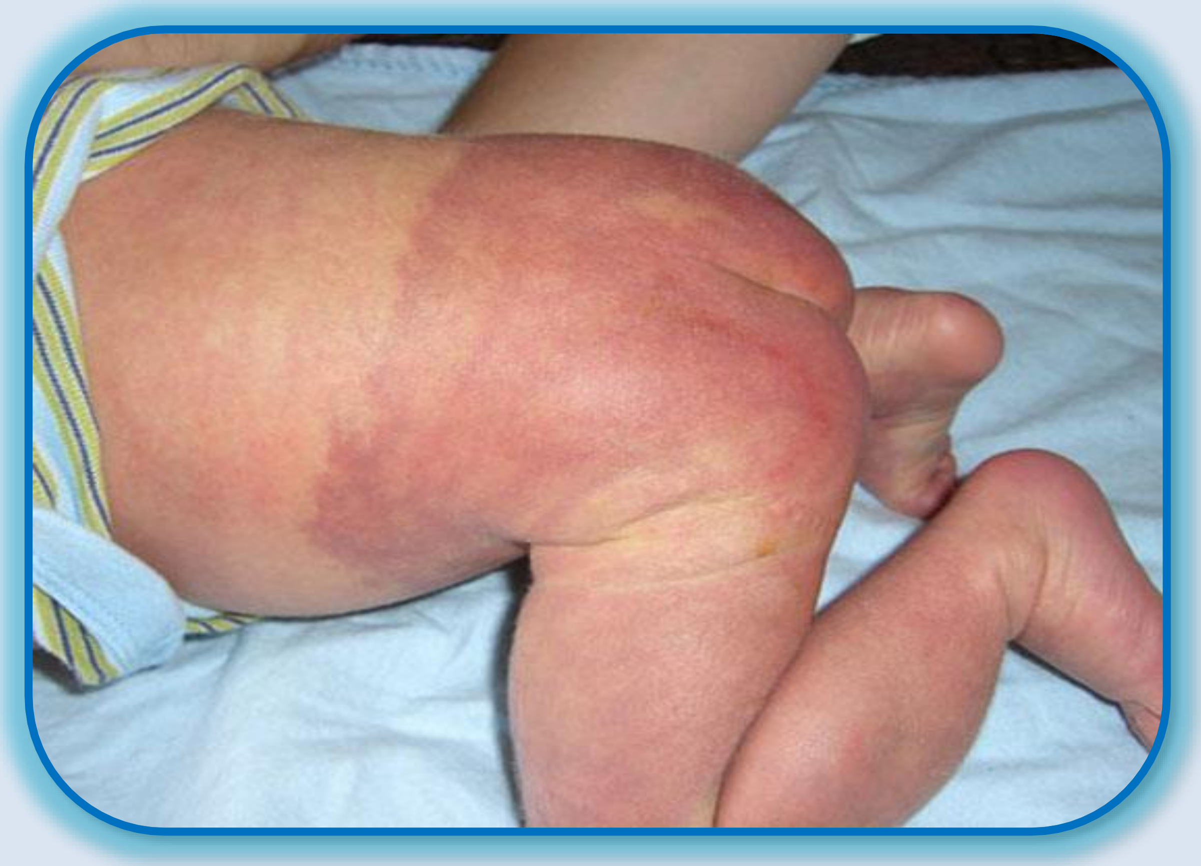
In this newborn, small spots can be seen over the eyelids and near the tip of the nose in addition to the large spot on the forehead.

"Stork Bite" Mark



Salmon patches may also be found on the nape of the neck in newborns. Nicknamed **"Stork Bite Marks"**, these lesions become less intense with time, but are frequently visible into adulthood.

Port Wine Stain



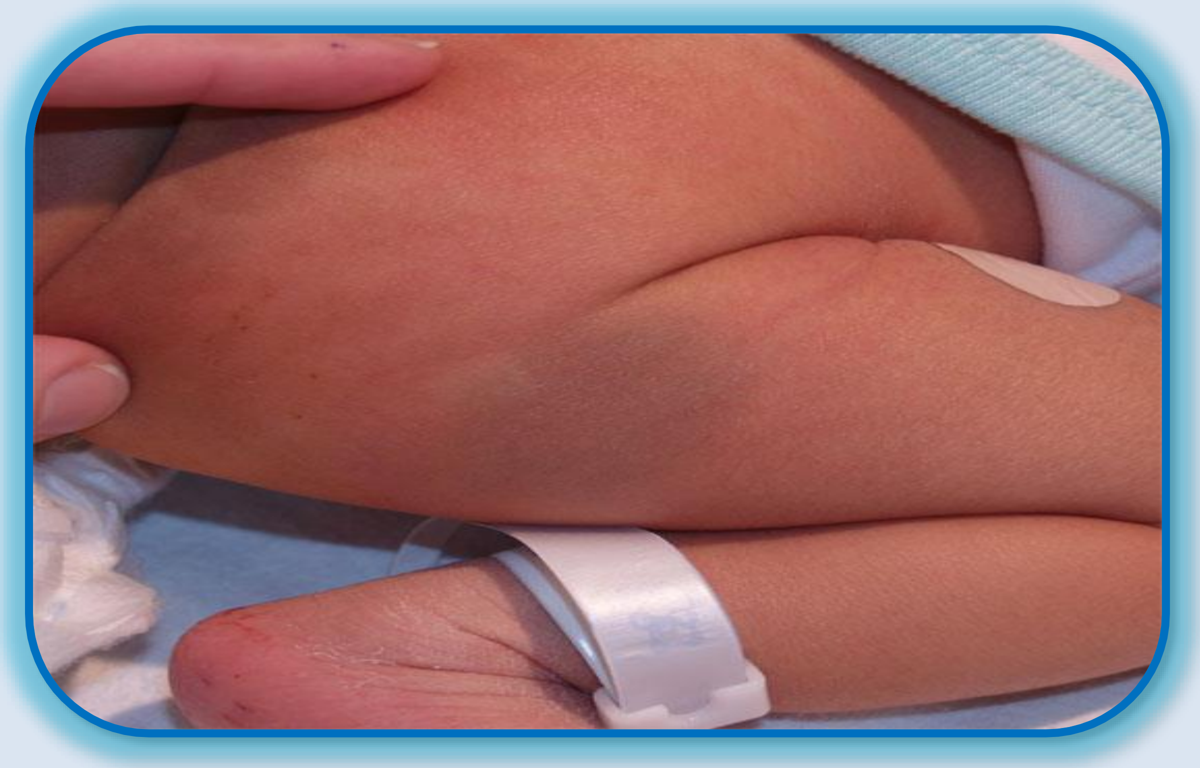
They are typically **more intense and purple-red in color than salmon patches**.

In some cases, as seen here, a port wine stain may affect a large surface area.

The discoloration is not, of itself, a problem, but it **may be a clue to an underlying condition**.

Port wine stains on the **face** may be associated with **Sturge-Weber syndrome**, and those on the **extremities** may be associated with **Klippel-Trenaunay-Weber syndrome**, in which overgrowth of an extremity may occur.

Hypopigmented Macule



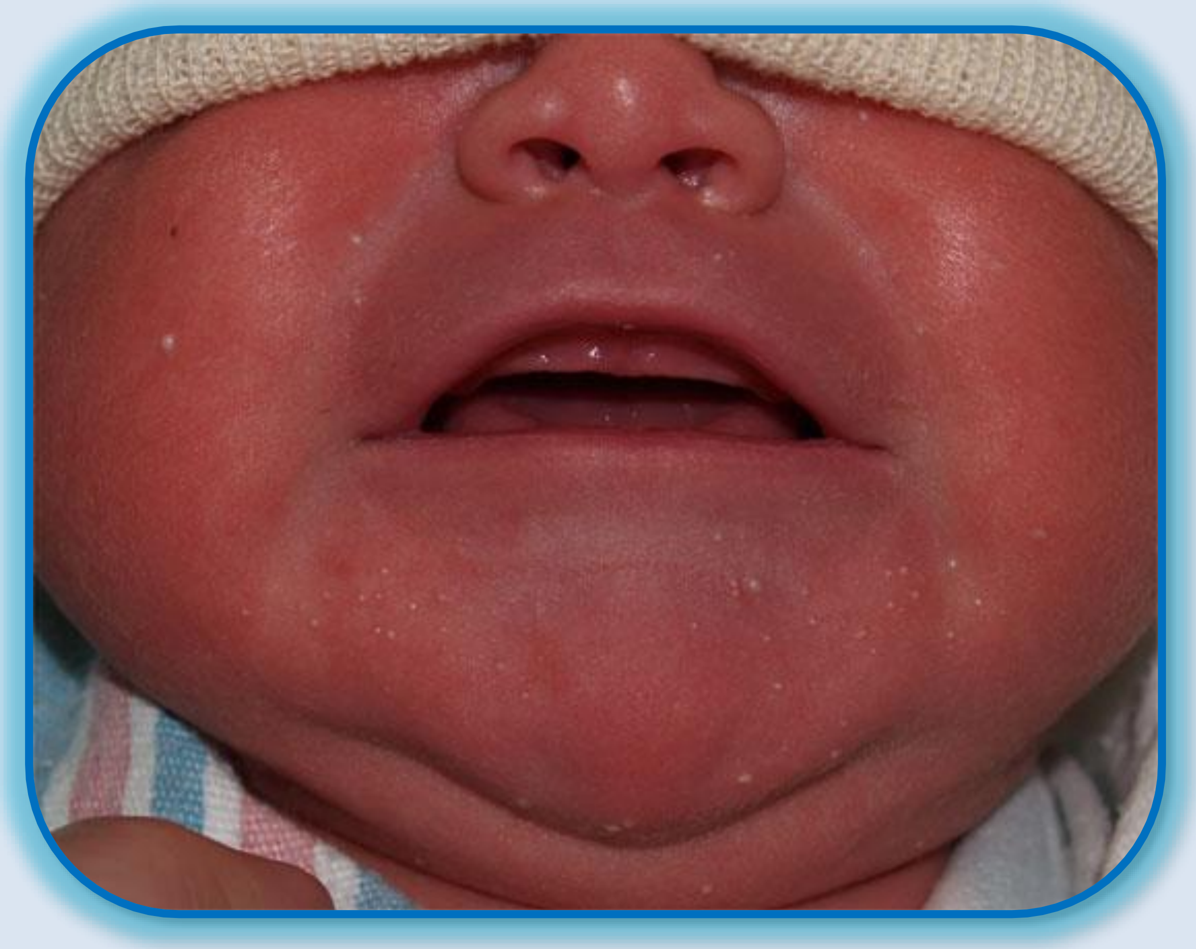
Hypopigmented macules are typically very **subtle, and benign**, findings in the newborn. In this patient, the macule partially overlaps the slate-grey patch.

It is usually transient, and caused by abnormal local vasoconstriction.

If it is important to differentiate vasoconstriction from true hypopigmentation, a **wood's lamp** can be used. If an abnormality of pigment exists, the lesion will appear bright under a wood's lamp, while areas of abnormal vasoconstriction will appear the same as the surrounding skin.

Ash leaf spots, associated with **tuberous sclerosis**, are rare in newborns; **usually they appear in children more than 5 years old**.

Milia

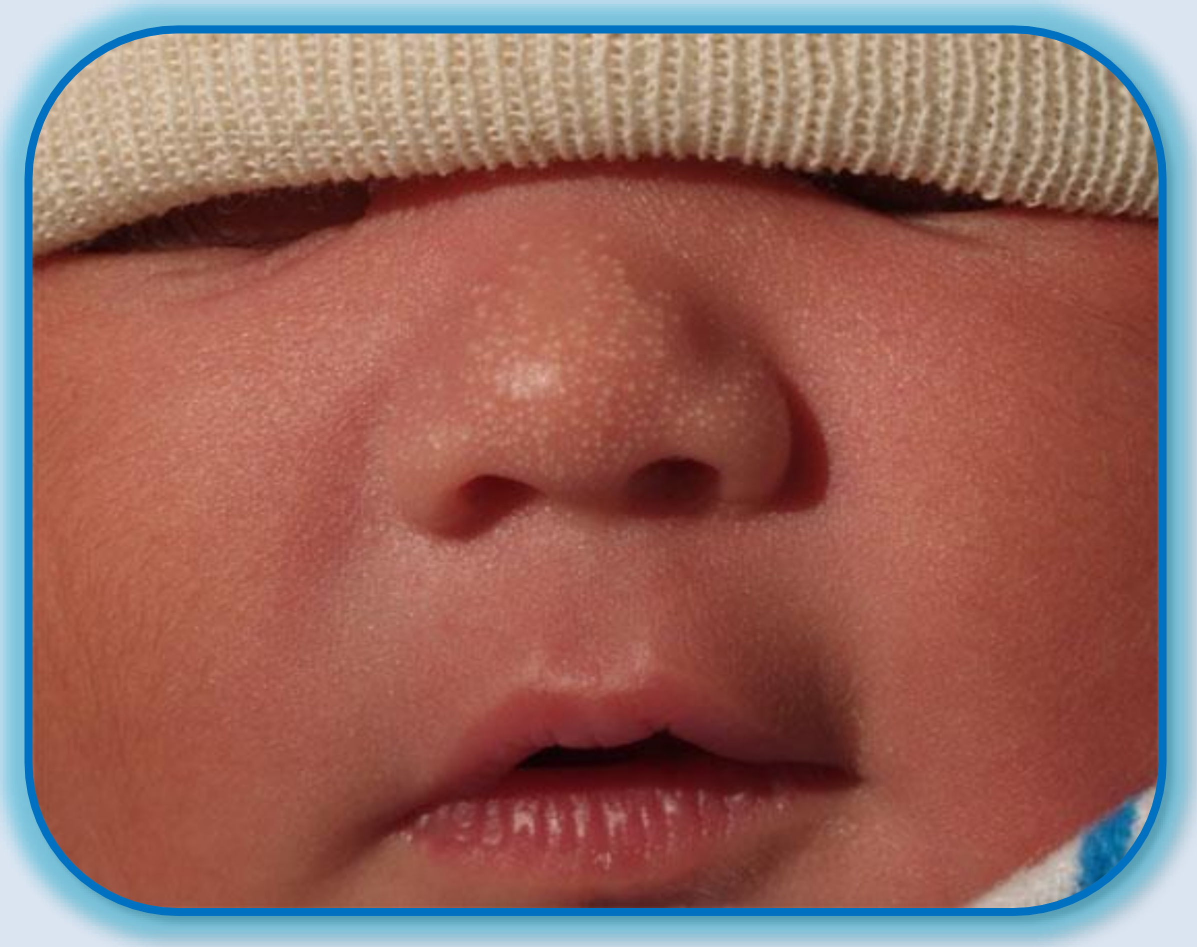


Milia are **keratin filled epithethial cysts** (white papules) which occur in up to **40% of newborns**.

Spontaneous exfoliation and resolution is expected within a few weeks.

Occasionally could be **mistaken for neonatal acne**, but milia are **present at birth** and have no inflammatory component. Acne, even though caused by maternal hormones, does not generally appear until *after* 2 weeks of age.

Sebaceous Hyperplasia

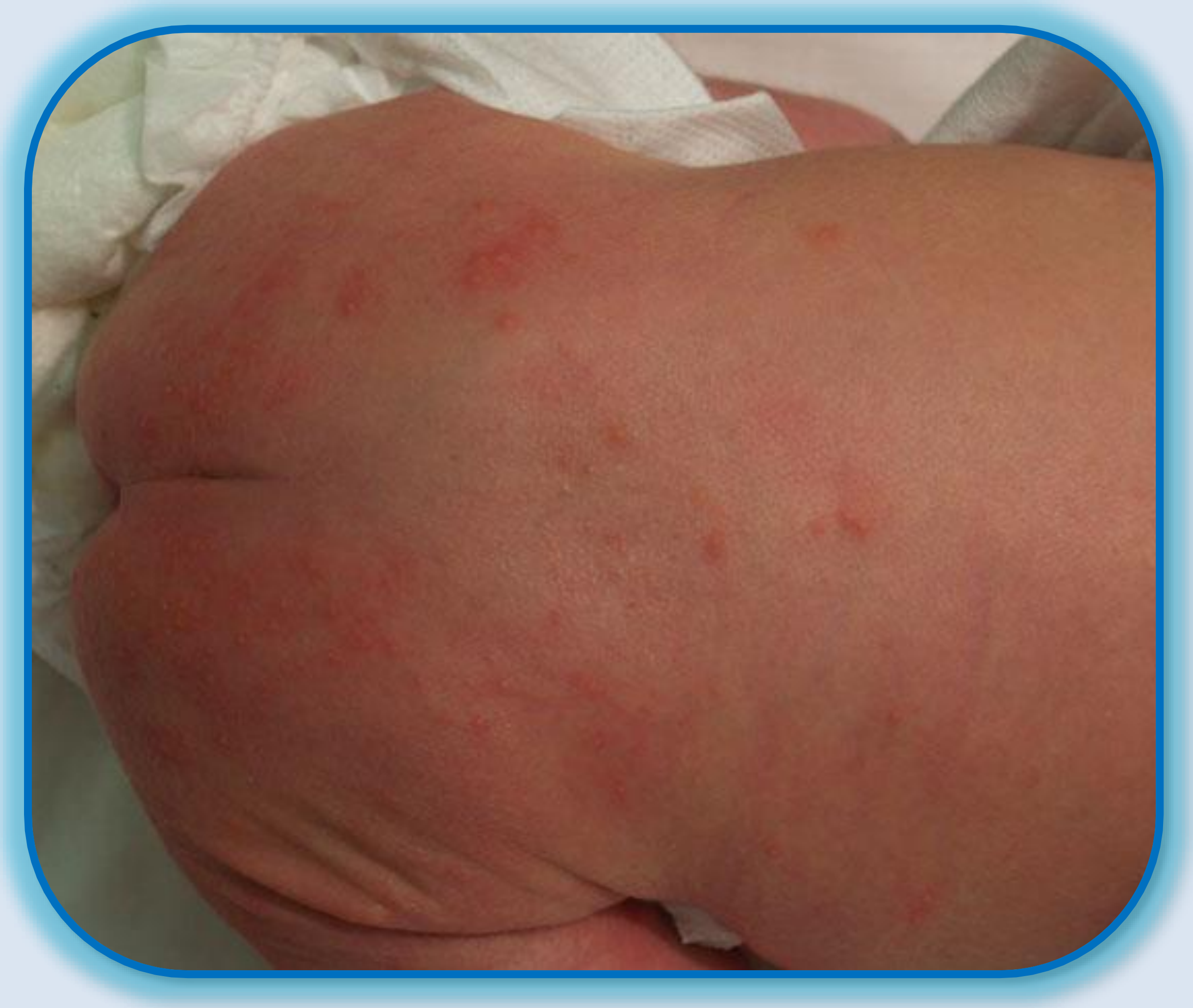


In contrast to milia, the raised lesions on the nose in this newborn are sebaceous hyperplasia. The lesions are **more yellow** than milia and are the result of **maternal androgen** exposure in utero.

Sometimes referred to as "the miniature puberty of the newborn", maternal hormone exposure may also cause vaginal withdrawal bleeding in infant girls and neonatal acne.

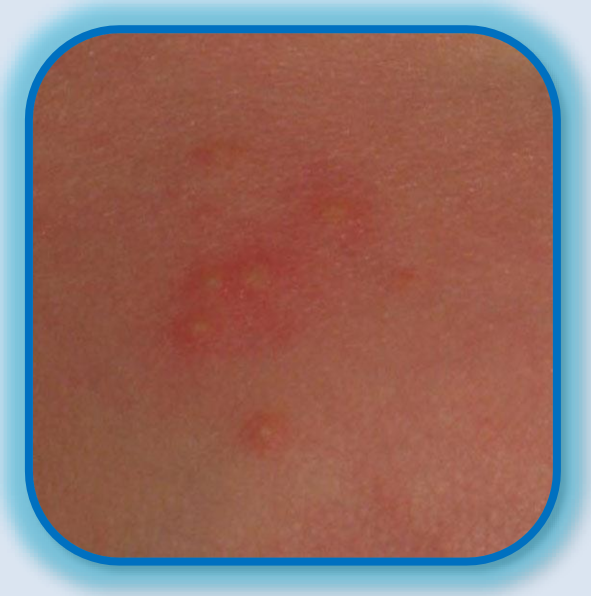
Sebaceous hyperplasia is a **benign** finding and **spontaneously resolves** with time. **No evaluation is needed**.

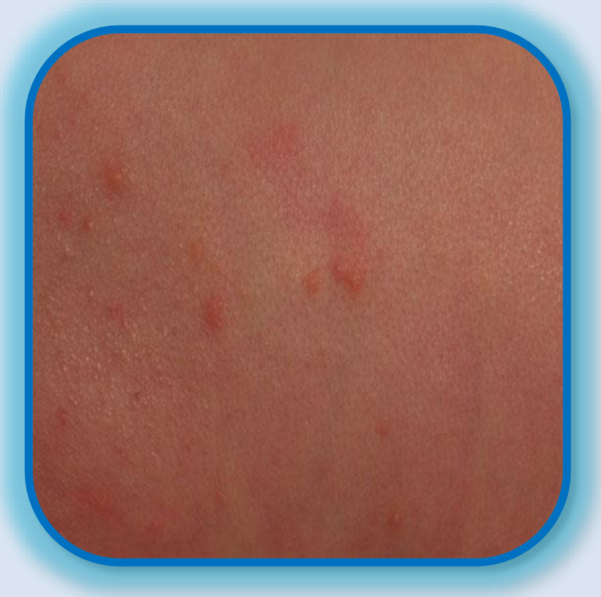
Erythema Toxicum Neonatorum



This is the "rash" most commonly observed in the neonates. Lesions generally **start on day 1 or 2** and increase in number over the next several days, followed by **spontaneous resolution** in about a week. Even newborns that have hundreds of spots are not symptomatic and **need no further evaluation**.

Erythema Toxicum Neonatorum



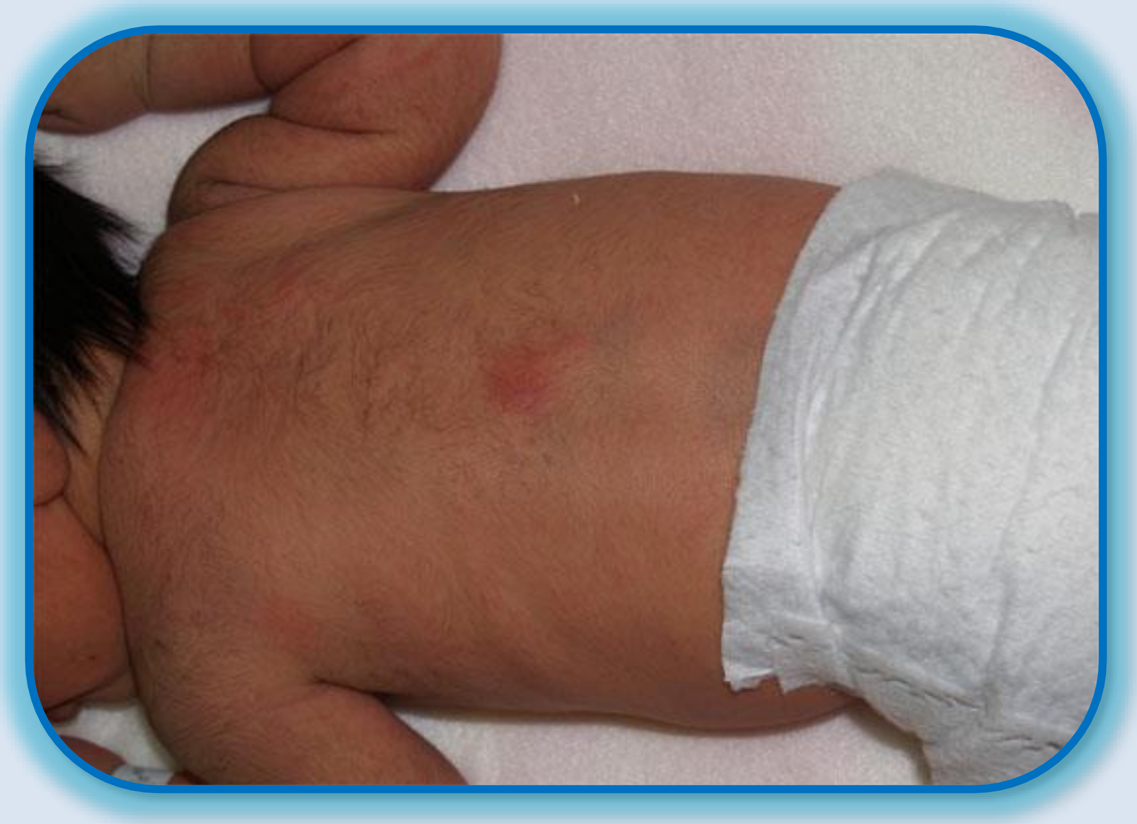


Another examples of erythema toxicum rash.

A **central, yellowish papule is surrounded by a halo of erythema**.

More than **half of all newborns** will have this to some degree.

Subcutaneous Fat Necrosis



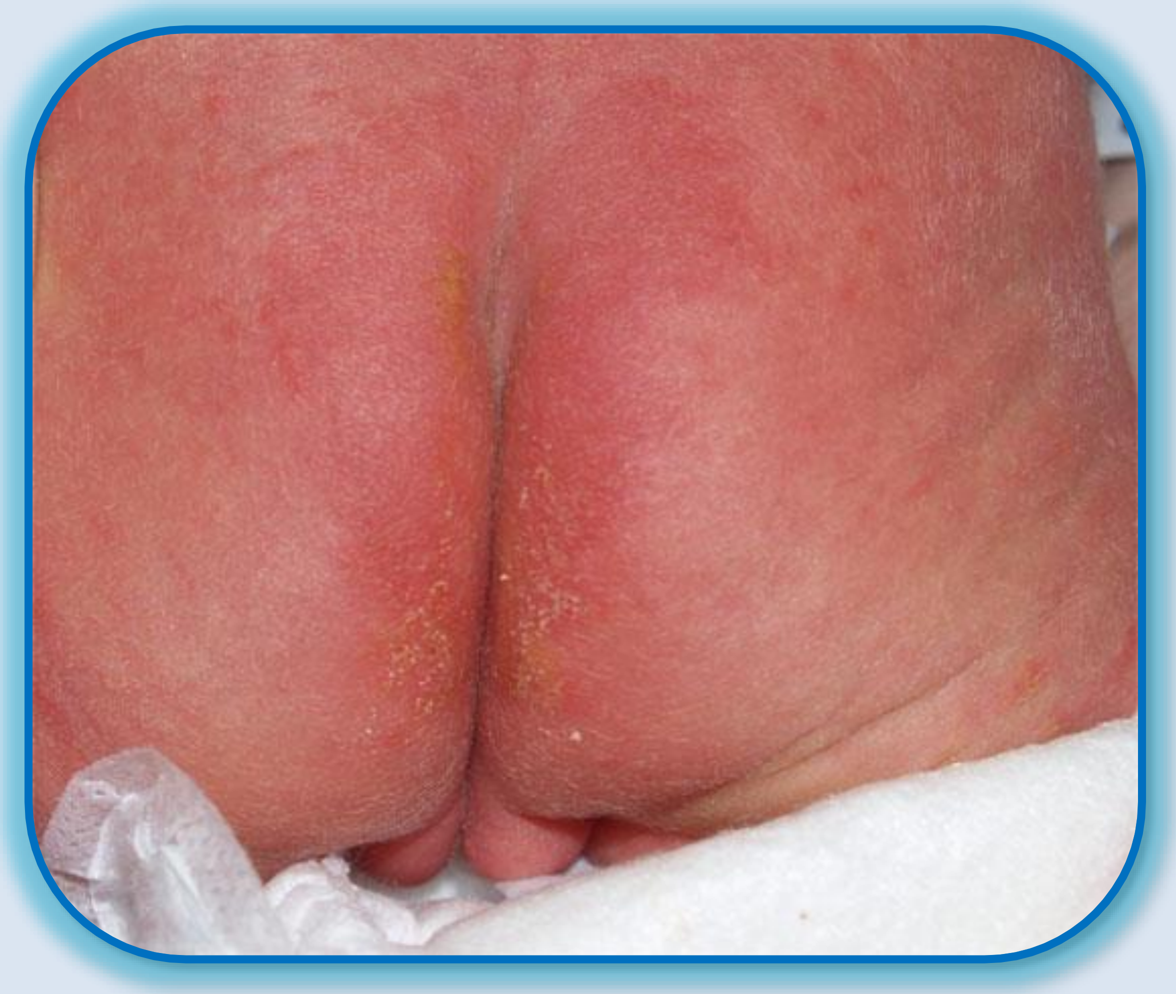
This **red** lesion is subcutaneous fat necrosis. **On palpation**, there is a **firm nodule** in the subcutaneous tissue under the area of redness that is **freely mobile** with respect to the bony structures underneath it.

Subcutaneous fat necrosis is **more common in** infants who have had difficult deliveries, cold stress, or perinatal asphyxia.

Lesions are typically **asymptomatic** and **resolve spontaneously** within several weeks, usually without scarring or atrophy.

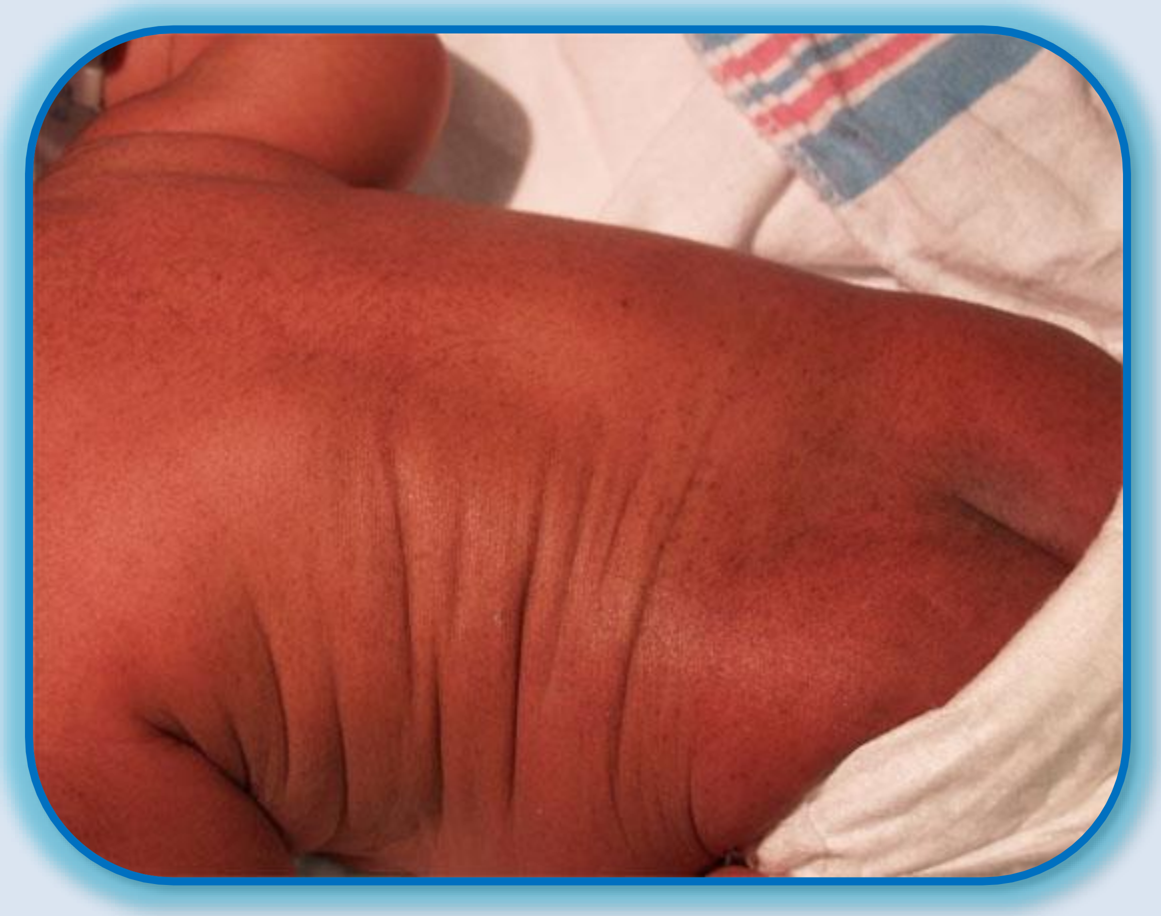
Infants with extensive lesions or with renal disease should have calcium levels followed once or twice weekly. **Hypercalcemia** associated with subcutaneous fat necrosis is rare, but is a potentially lethal complication.

Skin Irritation



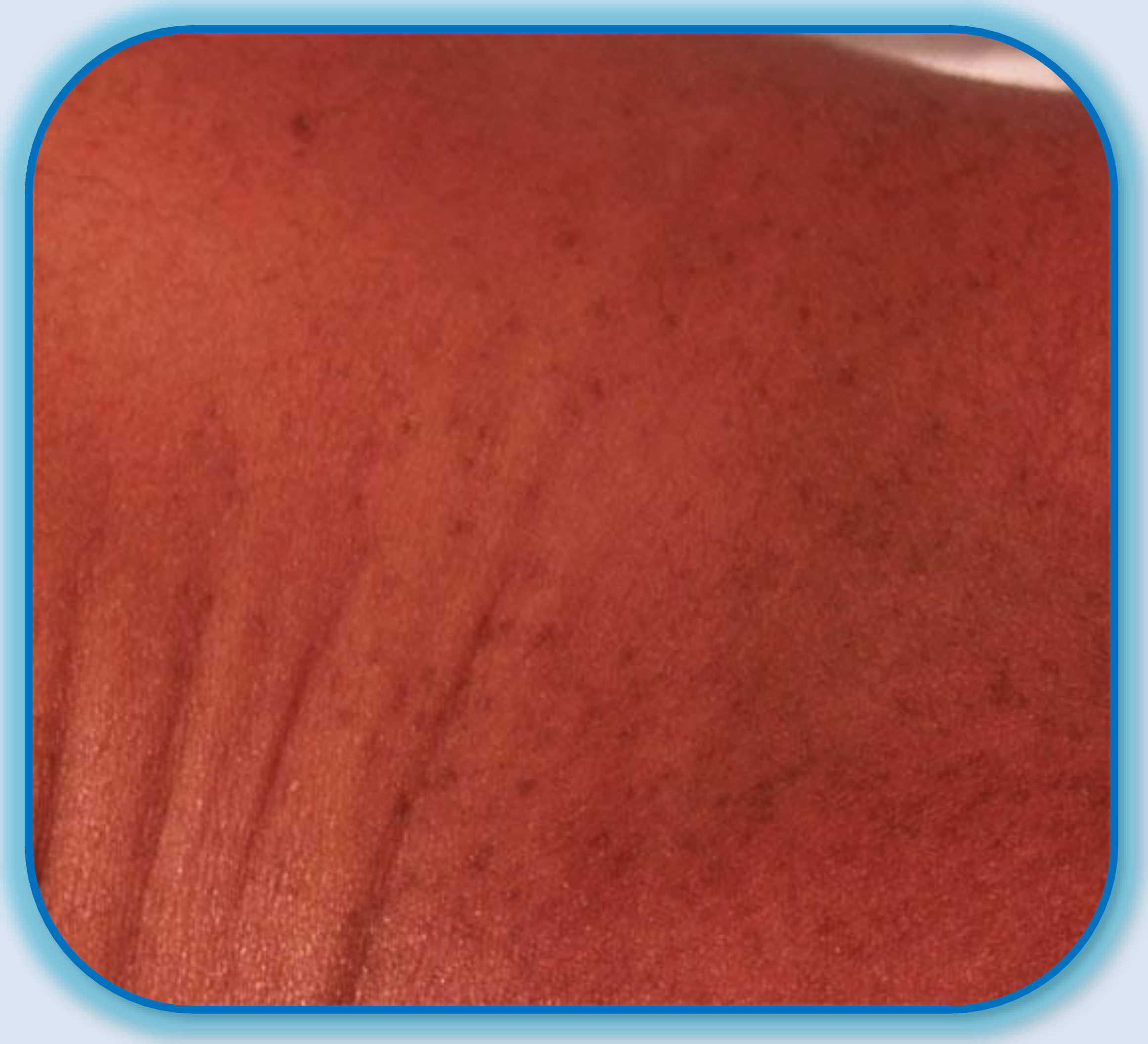
These raised yellow lesions are the result of irritated skin. Some newborns will have particularly sensitive skin, and may develop a "rash" of this type even in the absence of diarrhea or other known offending agents. Symptomatic care and good diaper hygiene (with thorough drying before the diaper is replaced) is recommended.

Transient Neonatal Pustular Melanosis



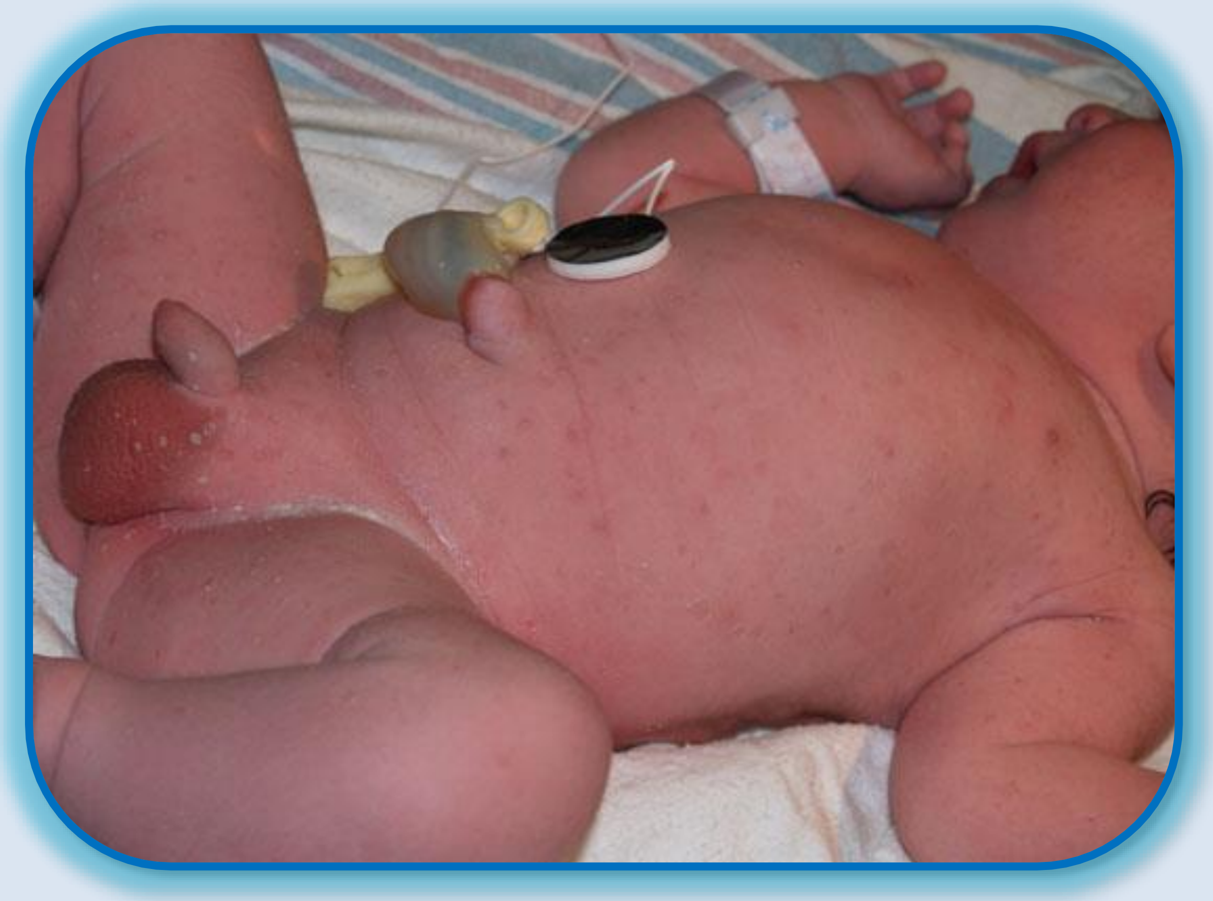
This infant was born with only the **hyperpigmented macules** present. Although the **etiology is unknown**, it has been observed that African Americans infants are more frequently affected with this condition, occurring in **up to 4%. Spontaneous resolution** is expected.

Transient Neonatal Pustular Melanosis



Here is a close-up of the lesions present in the previous photo.

Transient Neonatal Pustular Melanosis

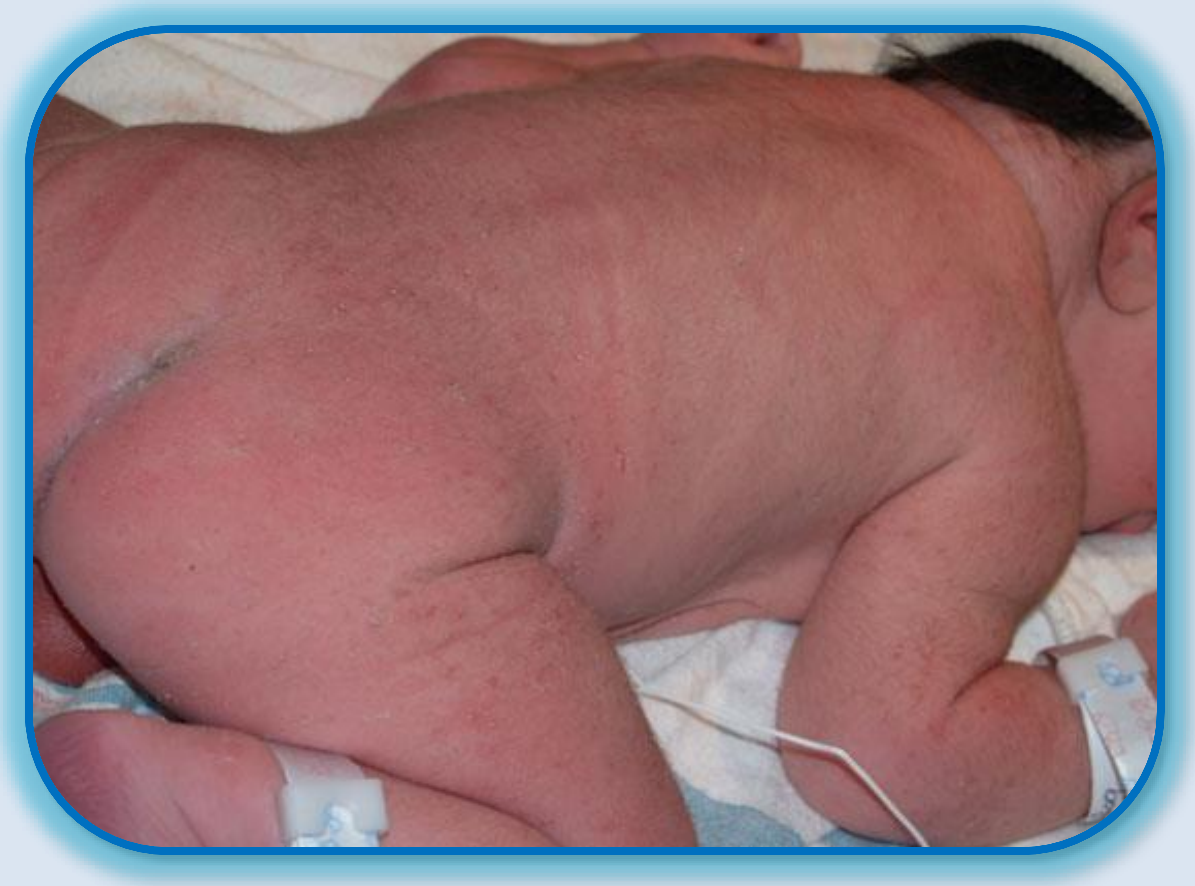


All the lesions seen here are consistent with this diagnosis. The hallmark of this rash is the **hyperpigmented spots** that remain (seen here on the chest) after the **fragile pustules** (seen on the scrotum and thigh) have resolved.

Because the rash starts in utero, lesions may be in any stage **at birth**.

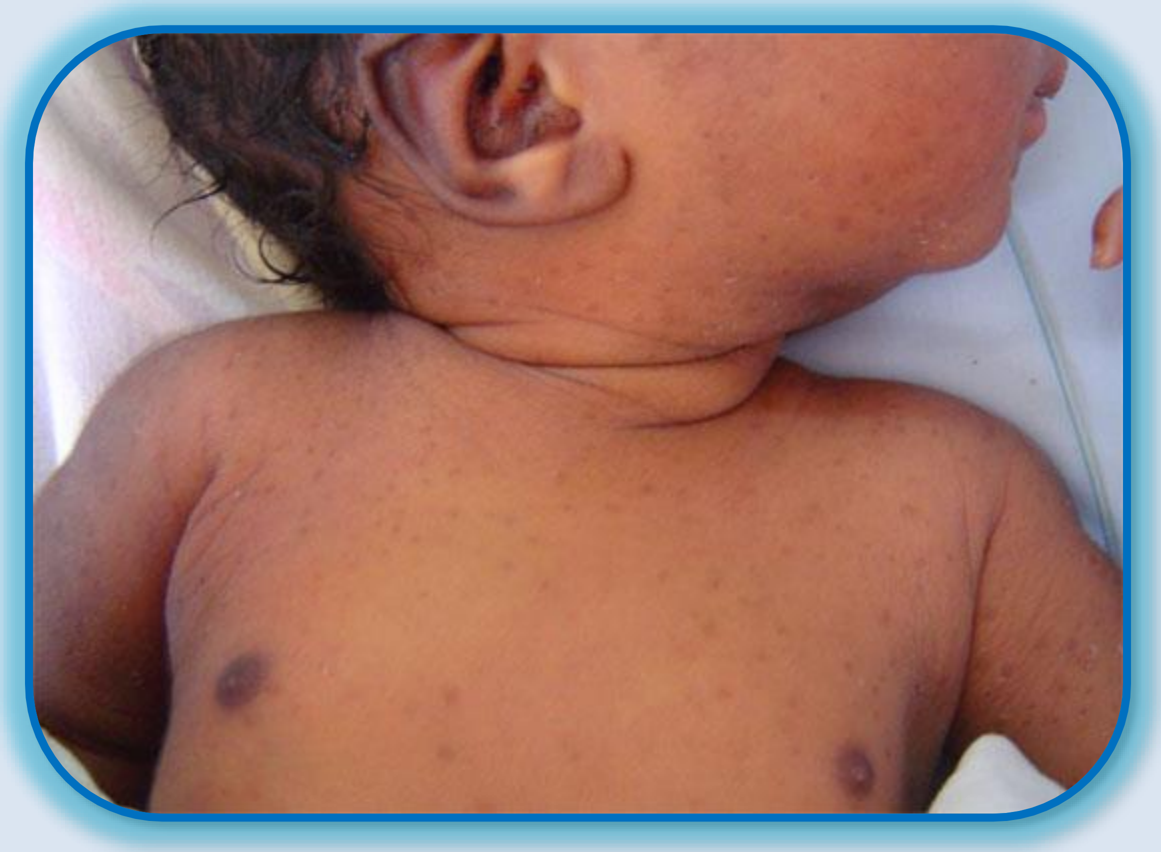
Despite the anxiety-provoking appearance of a newborn covered in pustules in the delivery room, **no evaluation is needed** when non-inflammatory pustules occur in combination with hyperpigmented macules in an otherwise well infant.

Transient Neonatal Pustular Melanosis



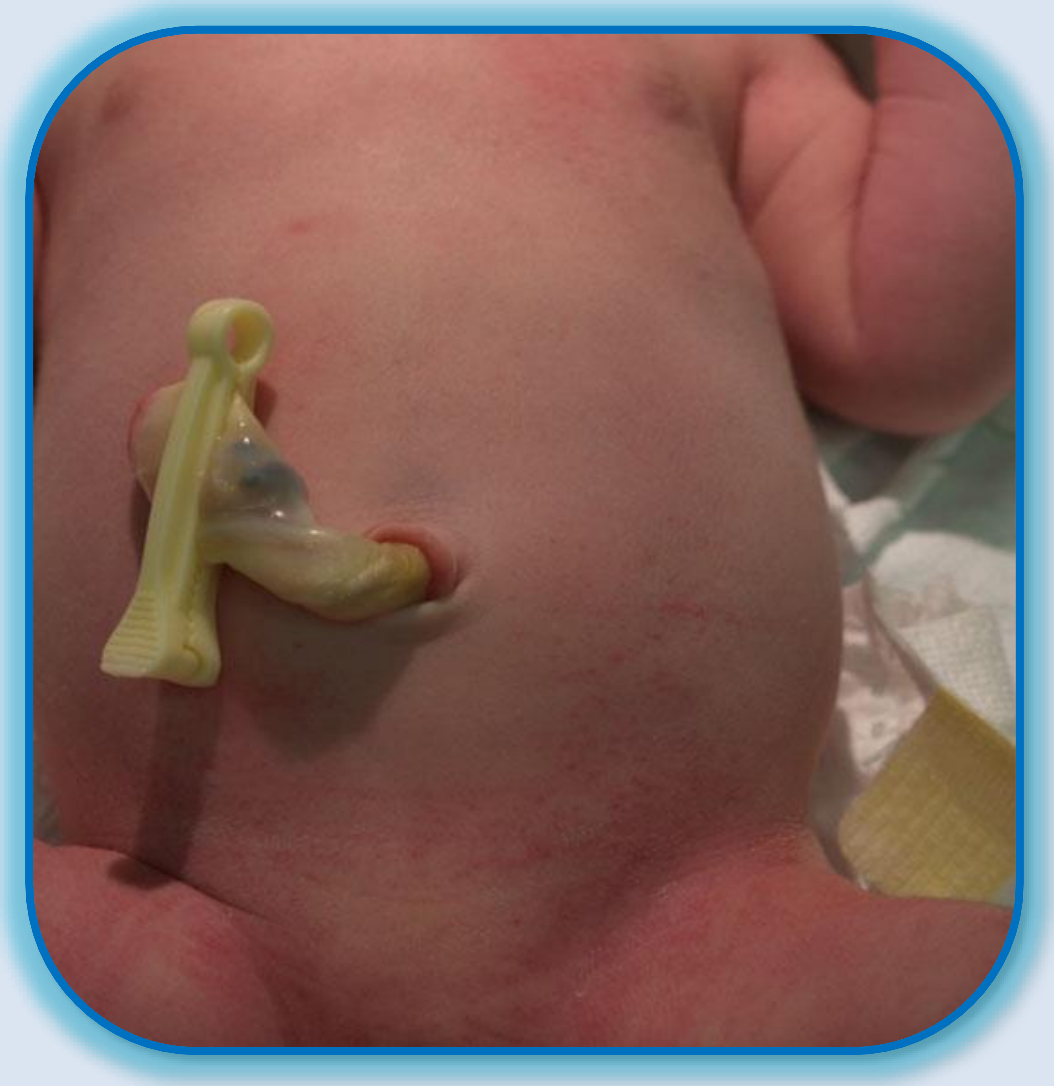
The back of the infant in the previous photo. Fewer pustules are noted here, but there are more hyperpigmented macules. These are expected to fade over several months. **The pustules are fragile and last only a day or two**.

Transient Neonatal Pustular Melanosis



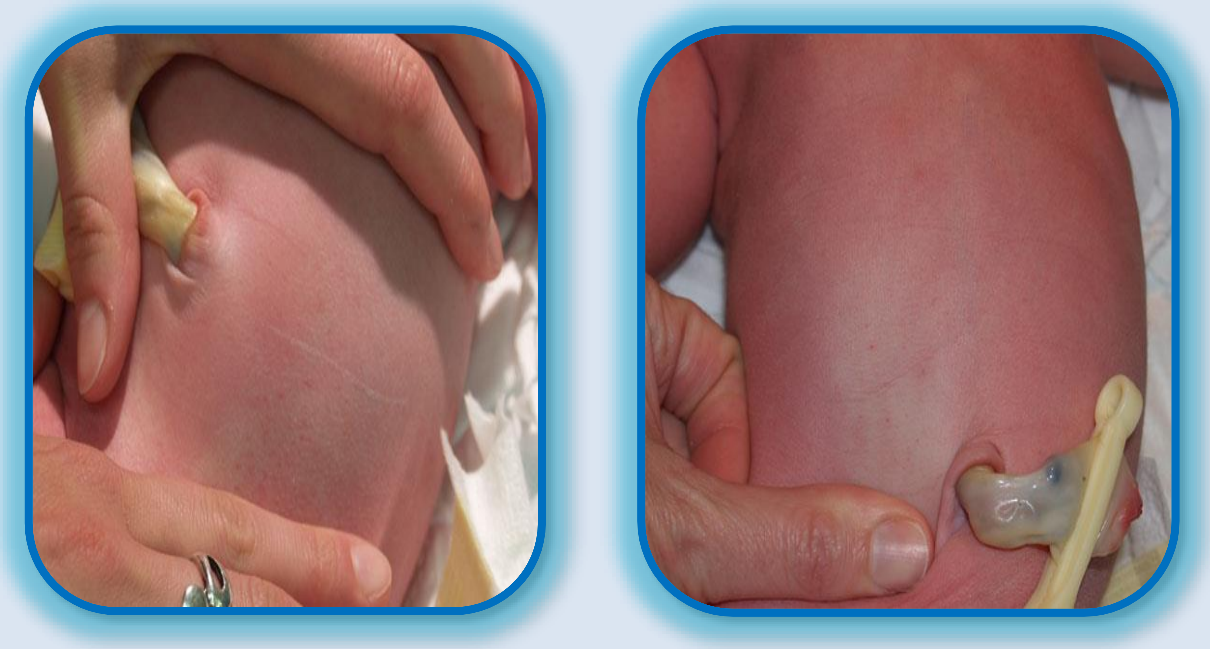
This is another infant with the **hyperpigmented macules** typical of neonatal pustular melanosis. In this photo, the "collarets of **scale**" that often surrounds the individual lesions can be appreciated (at the neck and the left axilla).

Petechiae



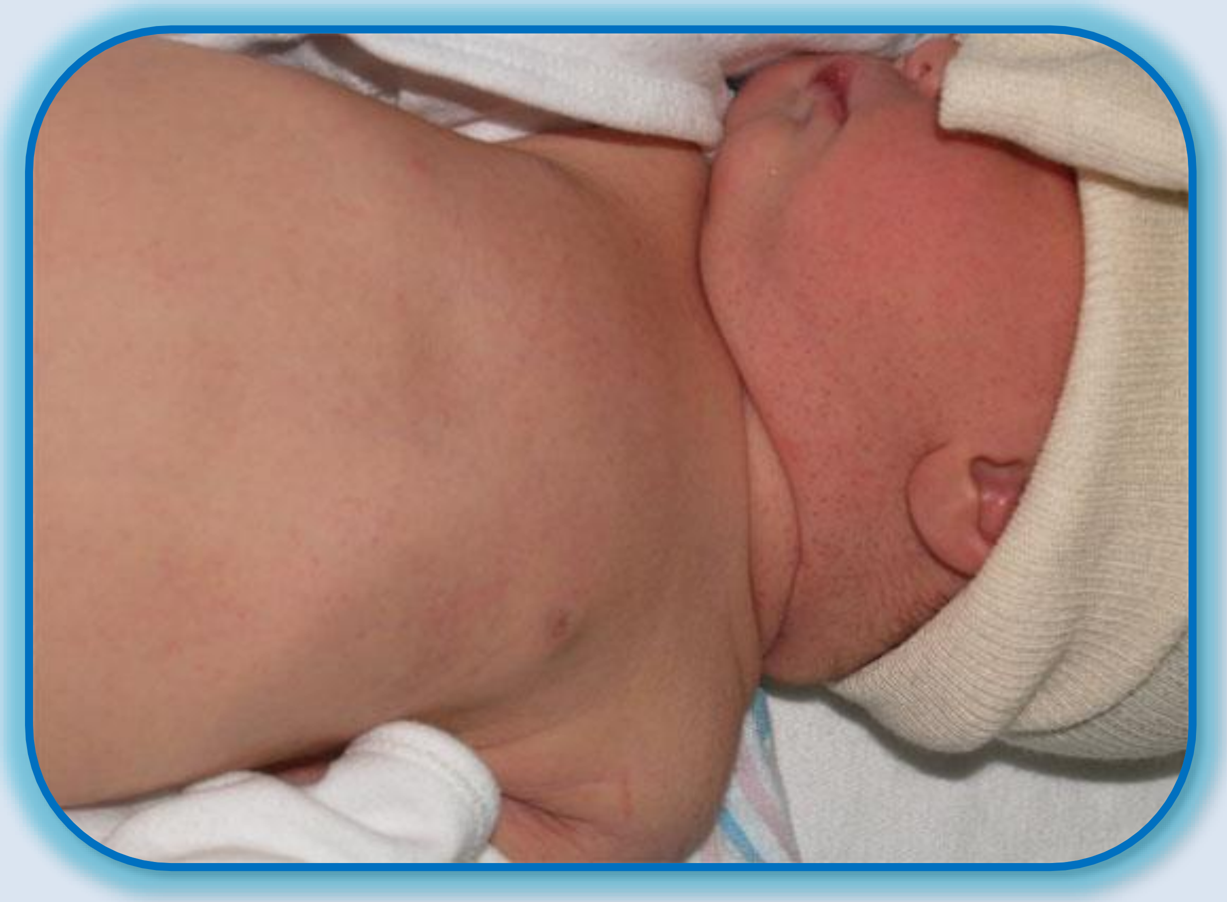
While petechiae may be due to pressure during birth, widespread petechiae deserve some evaluation; a CBC and platelet count in this infant was normal.

Petechiae



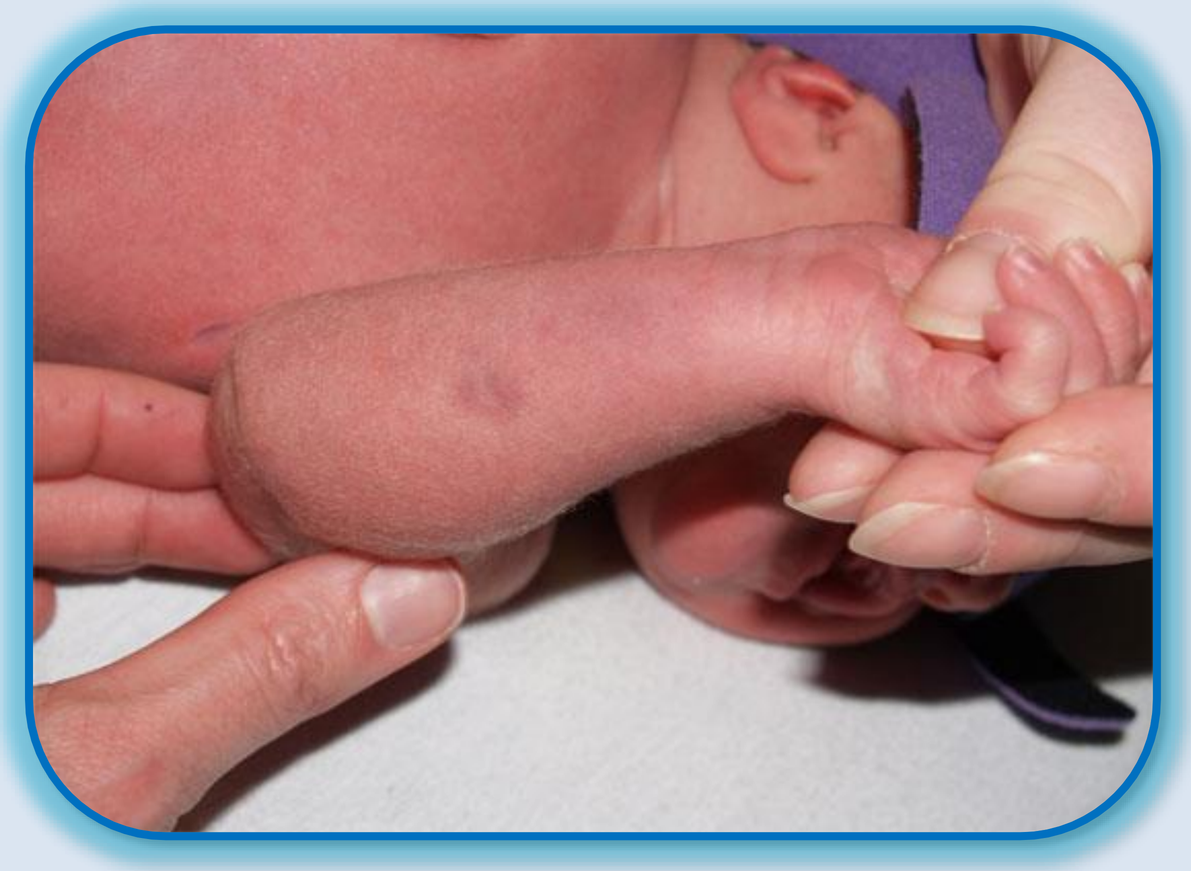
Blanching the abdomen reveals more petechiae than were appreciated on casual examination.

Petechiae



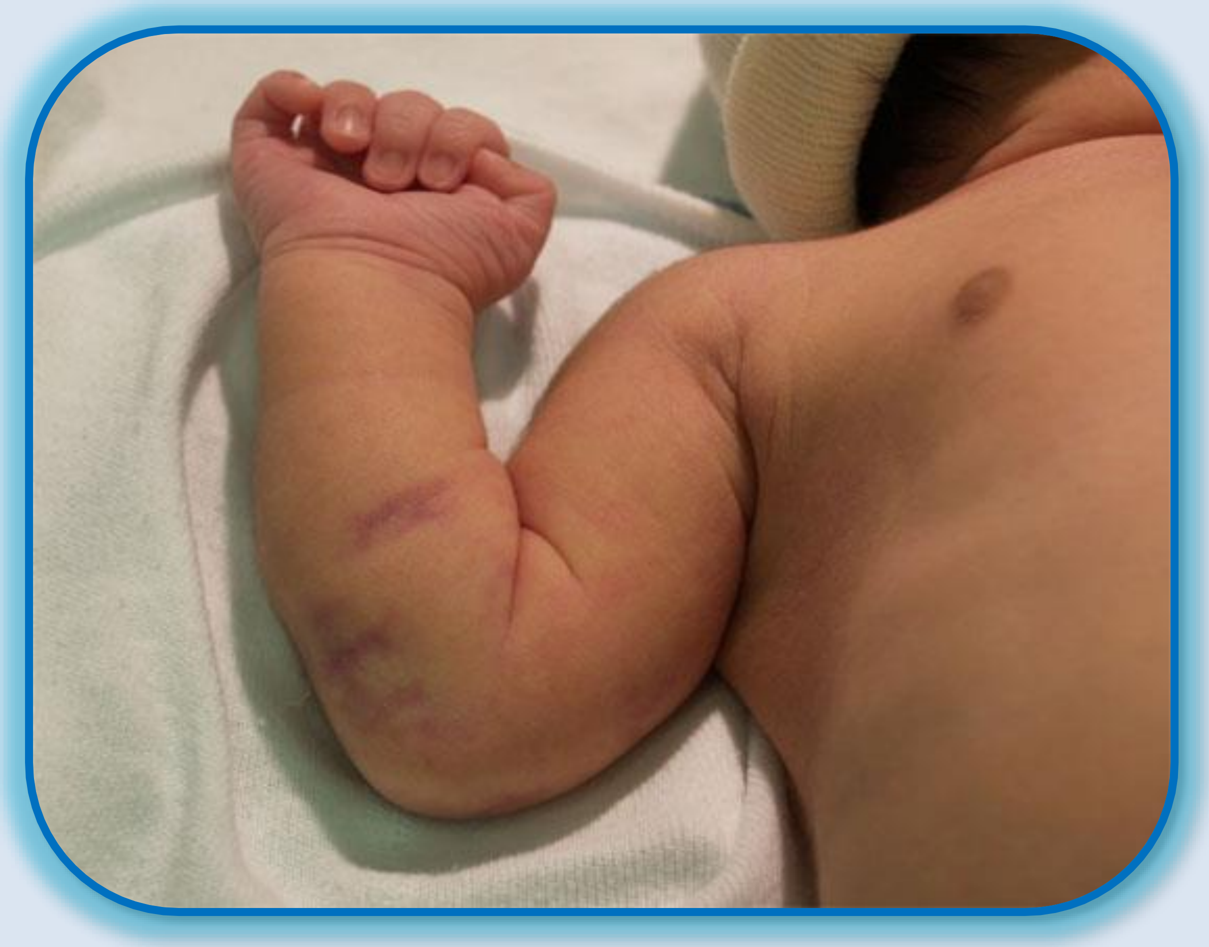
Another infant has petechiae primarily around the chin, neck, and upper chest. Given the relatively localized area affected in a newborn born vertex, no evaluation is needed.

Bruising



This infant had a somewhat difficult delivery, and as a result, sustained bruises on the head and the left arm. This picture was taken on the third day of life. By this time, the bruises were significantly improved from the appearance at birth.

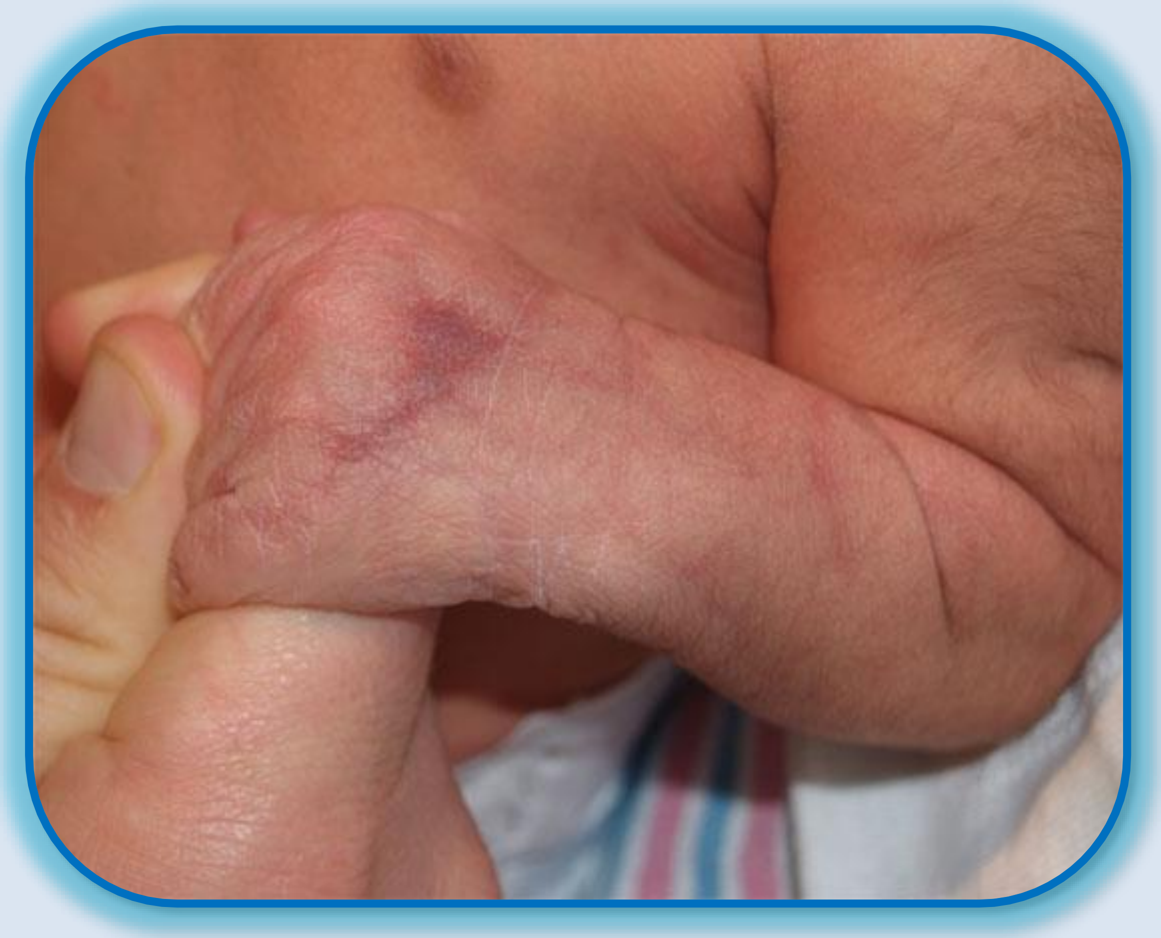
Cutis Marmorata Telangiectasia Congenita



On the initial physical examination, this infant was thought to have sustained bruising of the right arm during delivery. On closer inspection, however, the discolored areas are also **depressed**, suggesting some underlying atrophy of the skin. This is cutis marmorata tealngiectasia congenita, a **rare congenital vascular malformation**. The presentation seen here with **one limb affected** is most common.

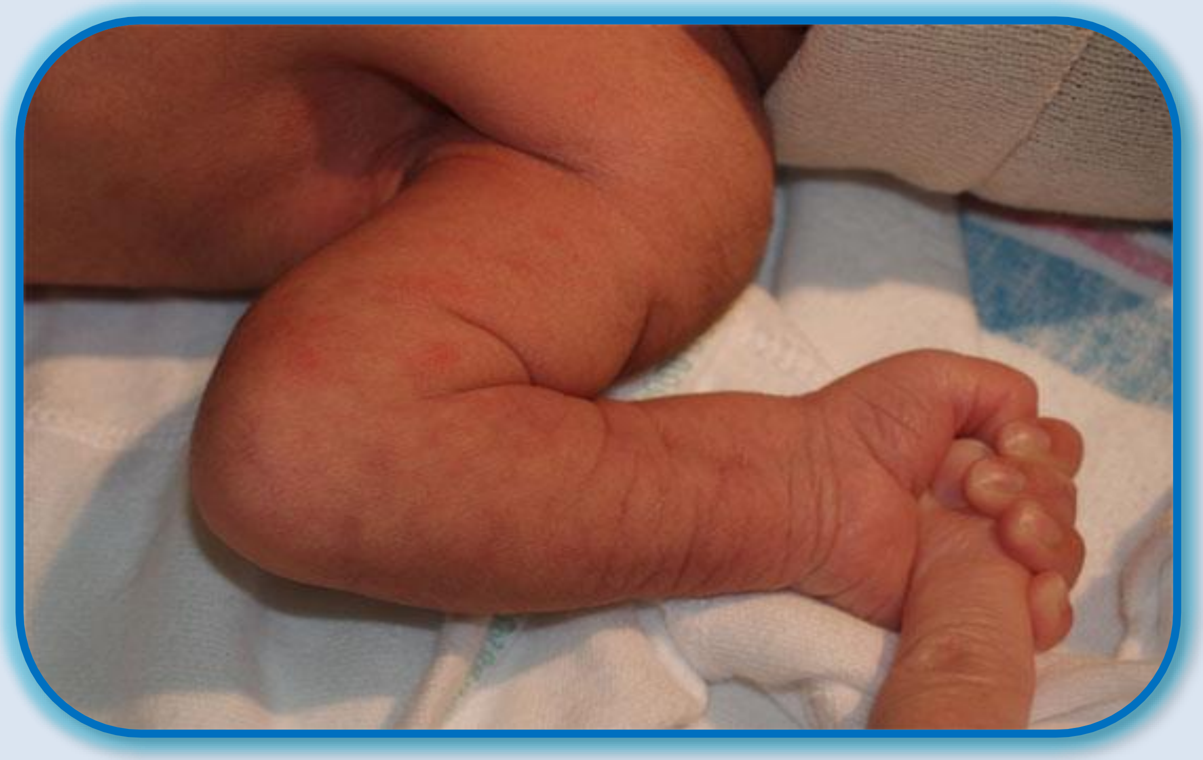
Associated defects may occur in up to **50%** of affected patients, but the cutaneous lesions tend to improve with time.

Cutis Marmorata Telangiectasia Congenita



In another patient, this dark purple lesion was noted on initial exam. **Port wine stain and bruising were considered in the differential diagnosis**, but the **angulated shape** made these possibilities less likely. In addition, there is a suggestion of dark **erythema streaking** from the lesion across the wrist.

Cutis Marmorata Telangiectasia Congenita



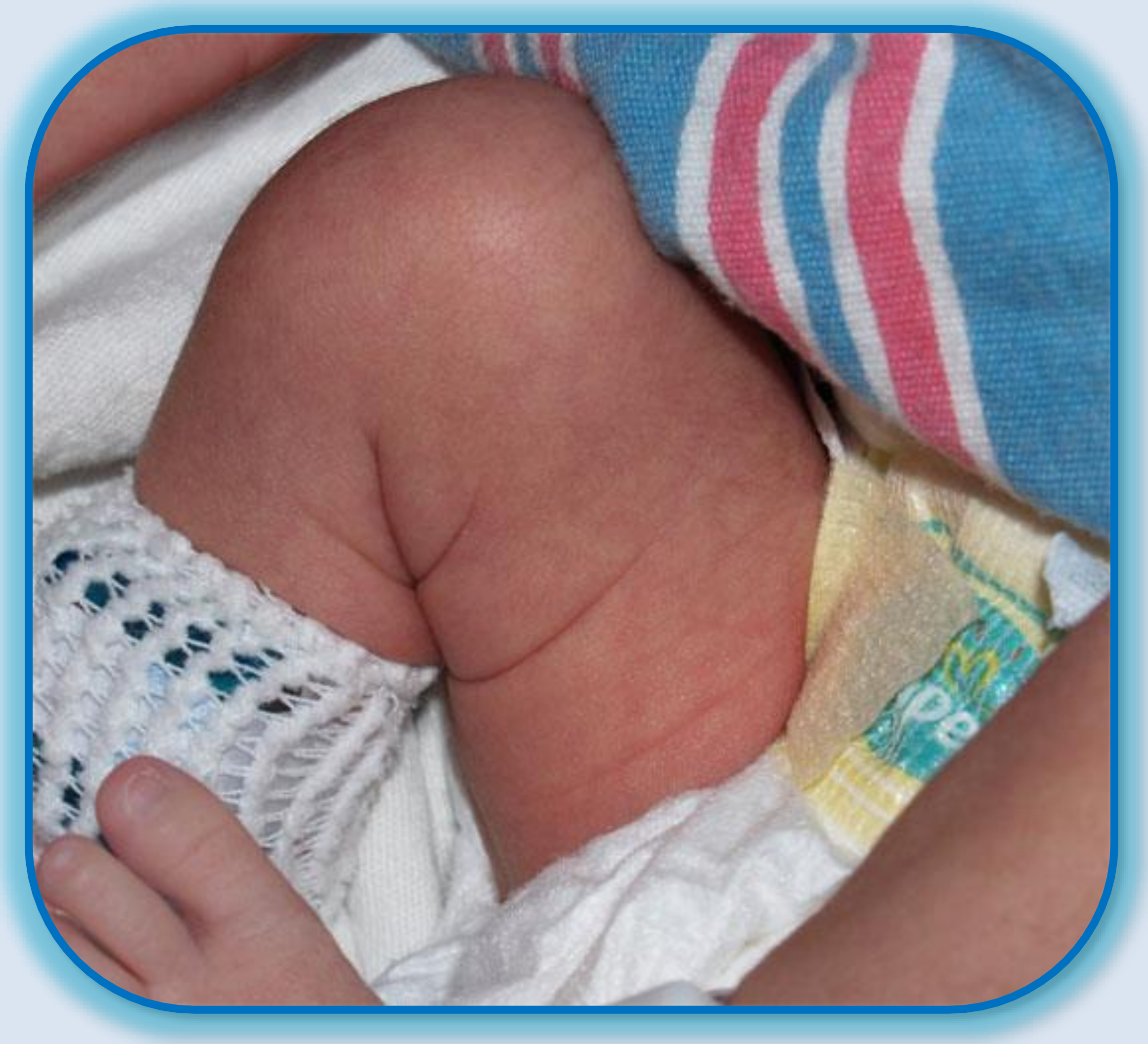
When the underside of the forearm was examined, mottled streaks of erythema were noted.

Although mottling occurs commonly in newborns exposed to cool temperatures, it is transient (disappears with rewarming) and more generalized than this.

Compare the mottled appearance of the forearm to the normal appearance of the upper arm to appreciate the difference.

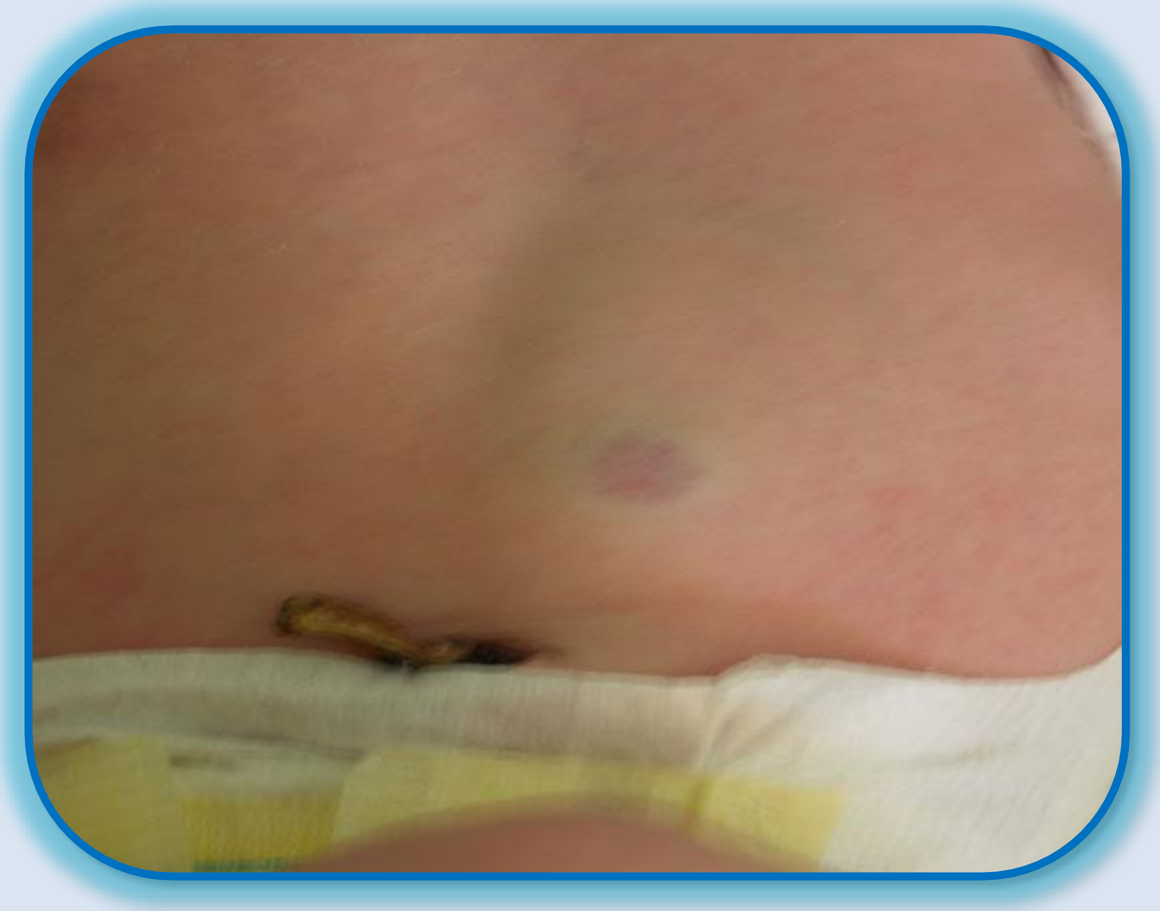
Cutis marmorata is the term used for mottling of the skin; in this case, the mottling is of the congenital, telangiectatic variety. Again, the skin lesions are expected to improve with time, but lesions should be followed for possible ulceration.

Mottling (Cutis Marmorata)



The **lacy erythema** present on the thigh of this newborn is mottling. Not to be confused with cutis marmorata telangiectasia congenita, cutis marmorata (mottling) is a **transient and common** finding in newborns. It is particular visible when the infant is cold and **disappears with warming.**

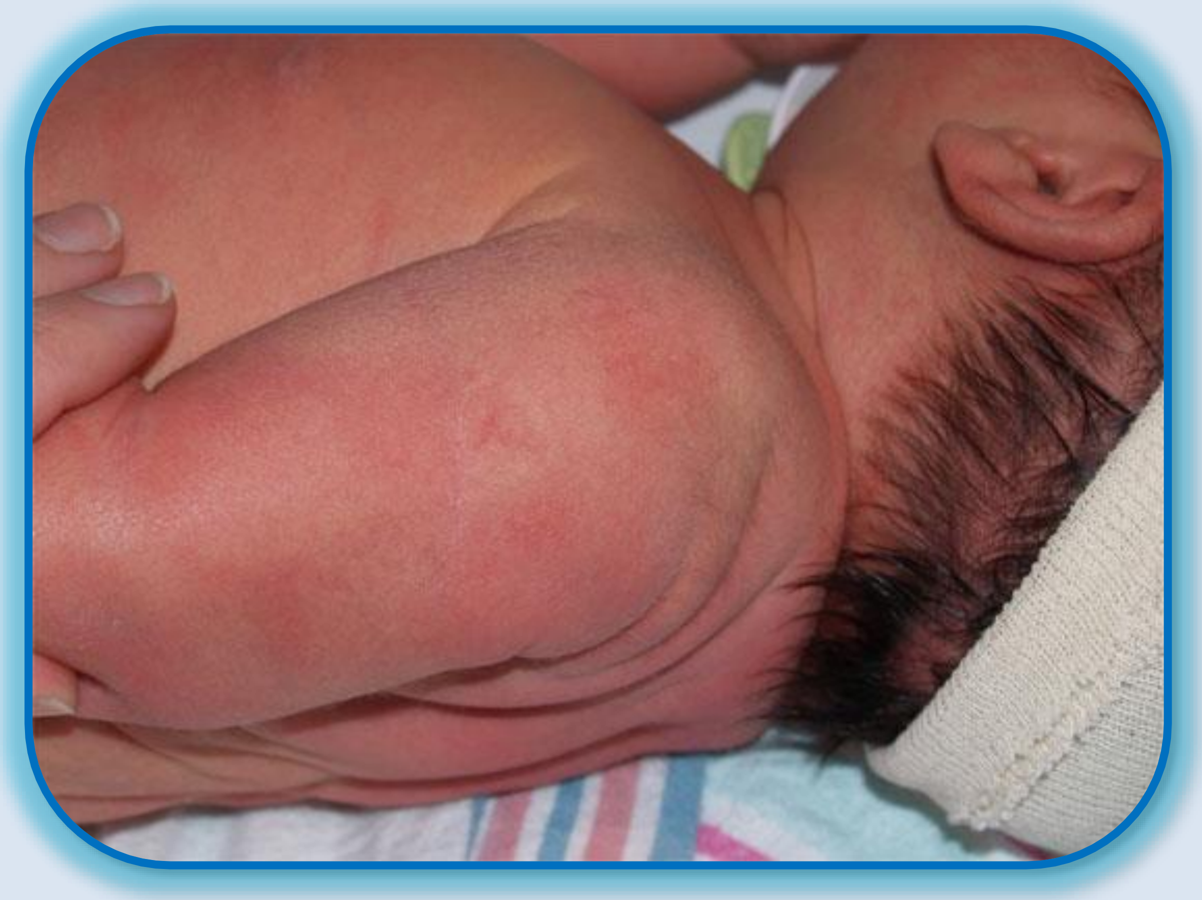
Early Hemangioma



In the newborn nursery, the raised, red appearance of a strawberry hemangioma is not usually seen. Instead, the precursors of these lesions are found.

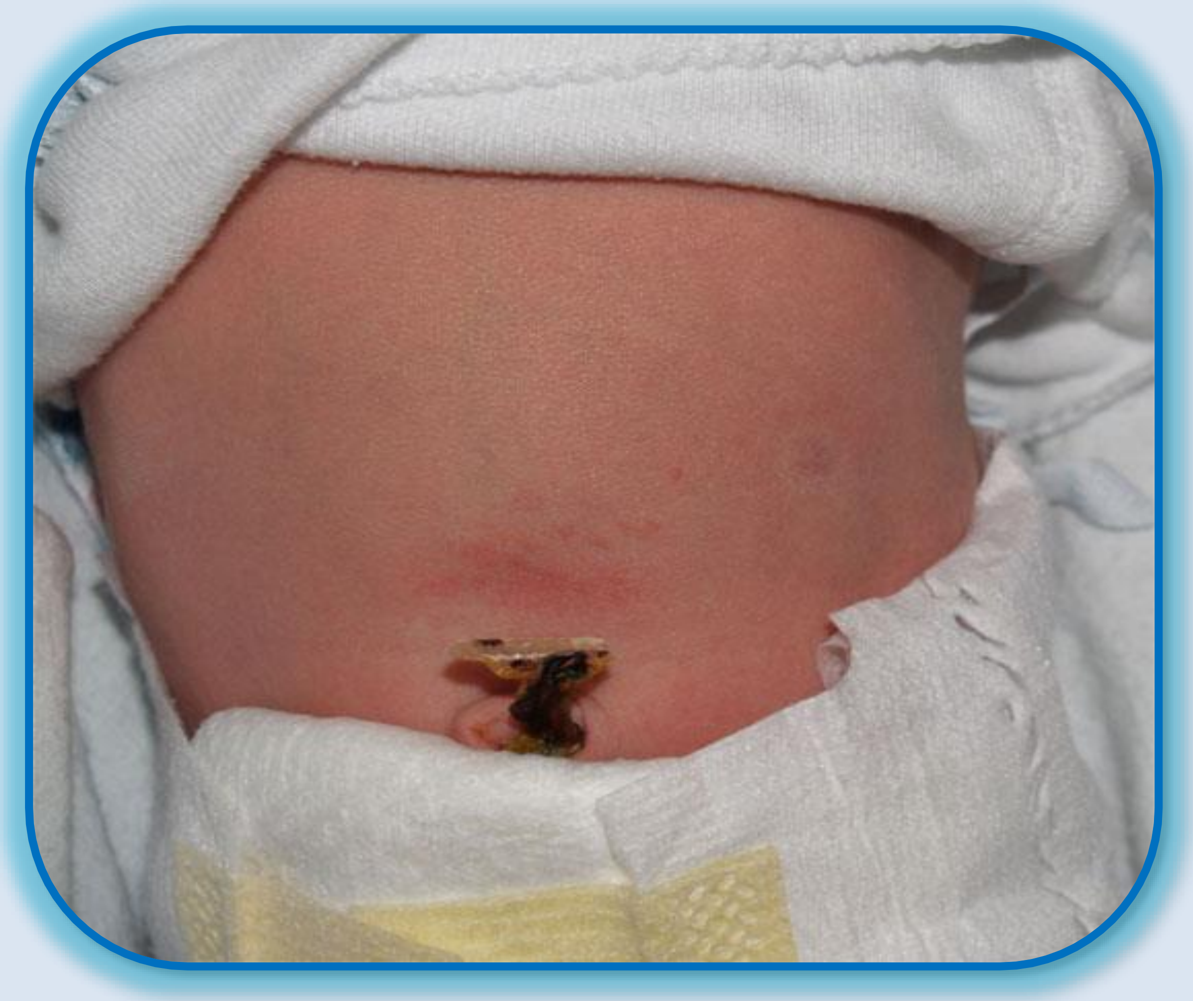
Although this photo is somewhat blurry, the lesion at this stage contains a central area of telangiectasia surrounded by a halo of pallor.

Early Hemangioma



This lesion is much more subtle and is completely flat, but the circular area of pallor with central vascular markings can still be seen on the upper arm of this newborn.

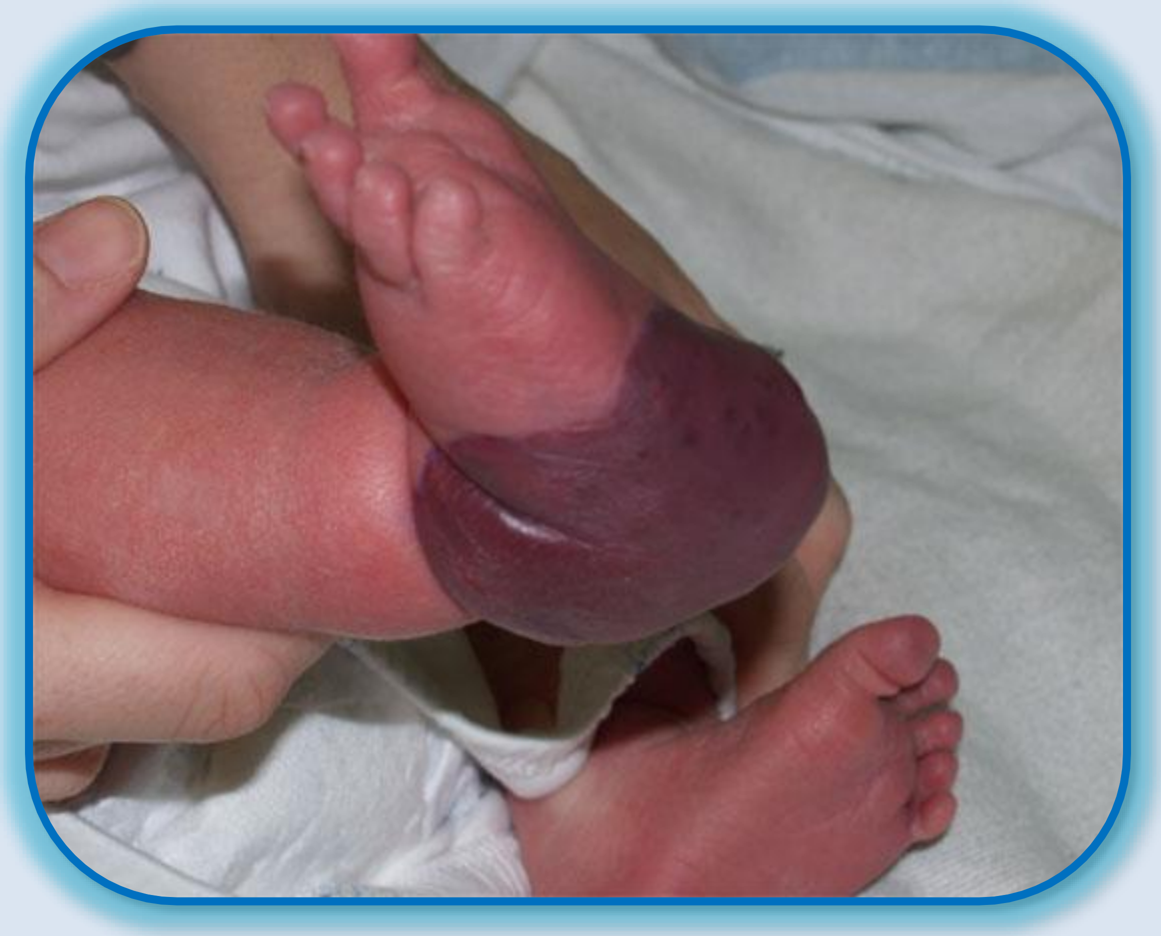
Early Hemangioma



The small, circular, pale area on the left side of the baby's abdomen is the hemangioma. In this position, no problems would be expected.

Lesions located in an area of chronic irritation (diaper area) or near vital structures (eye) can be problematic and may require treatment when they grow and become raised, but typically the best cosmetic result is obtained if the lesion is left to grow and involute spontaneously.

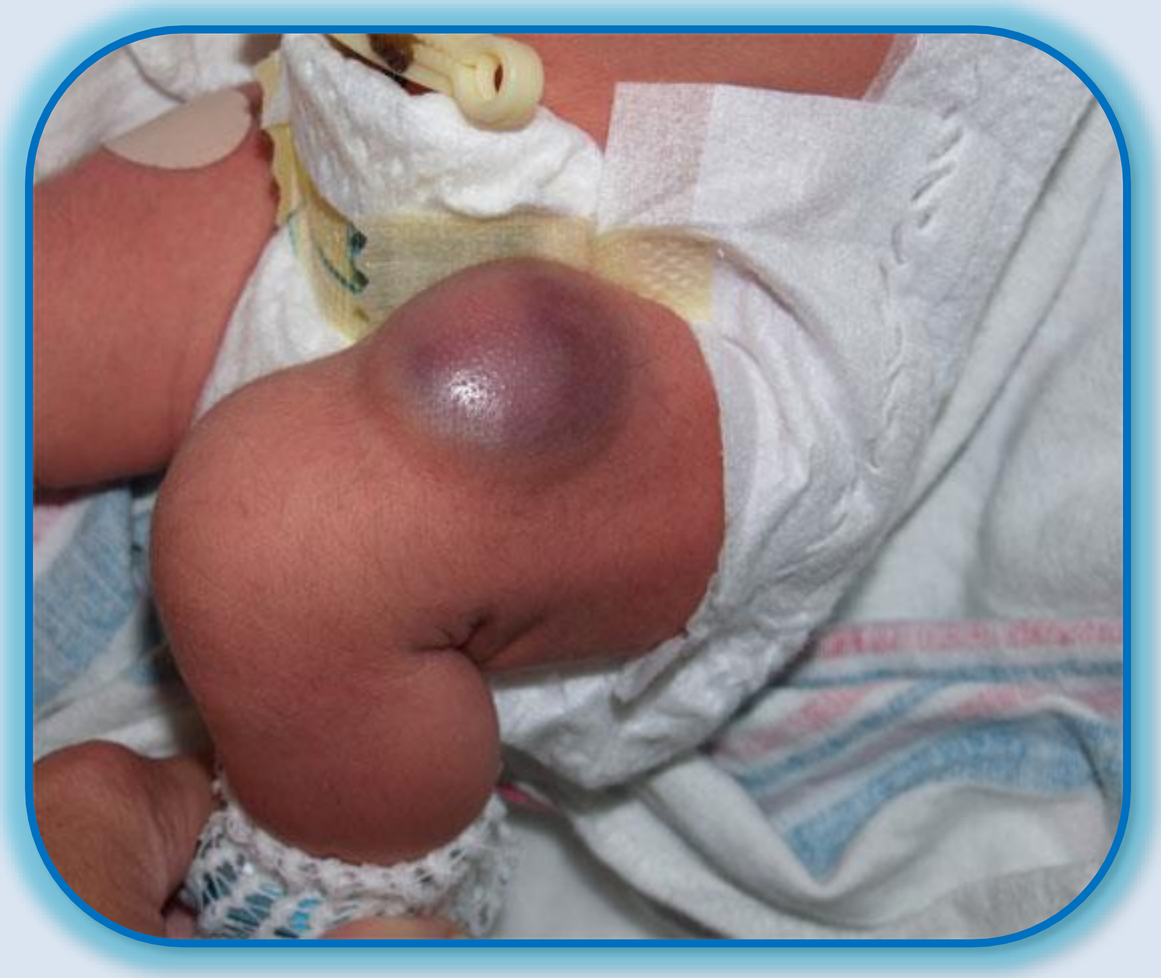
Congenital Hemangioma



A much more unusual presentation of hemangioma is shown here. This vascular lesion on the heel was present at birth.

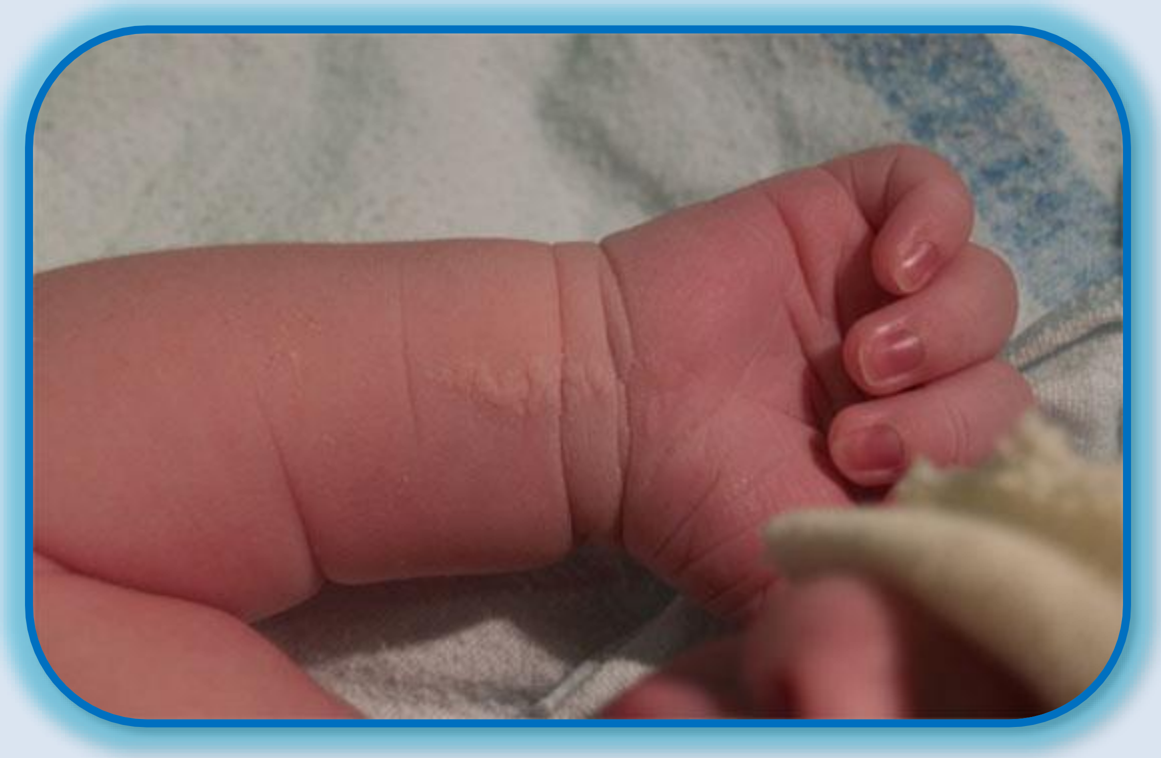
This particular infant did not develop **Kasabach-Merritt syndrome**, though that **was a concern**, and the lesion began spontaneous involution after about 6 months of age.

Congenital Hemangioma



This is another fairly large congenital hemangioma. In this case, the hemangioma appears to have more deep involvement. Again, **unless complications arise, the best course of action seems to be watchful waiting**.

Epidermal Nevus

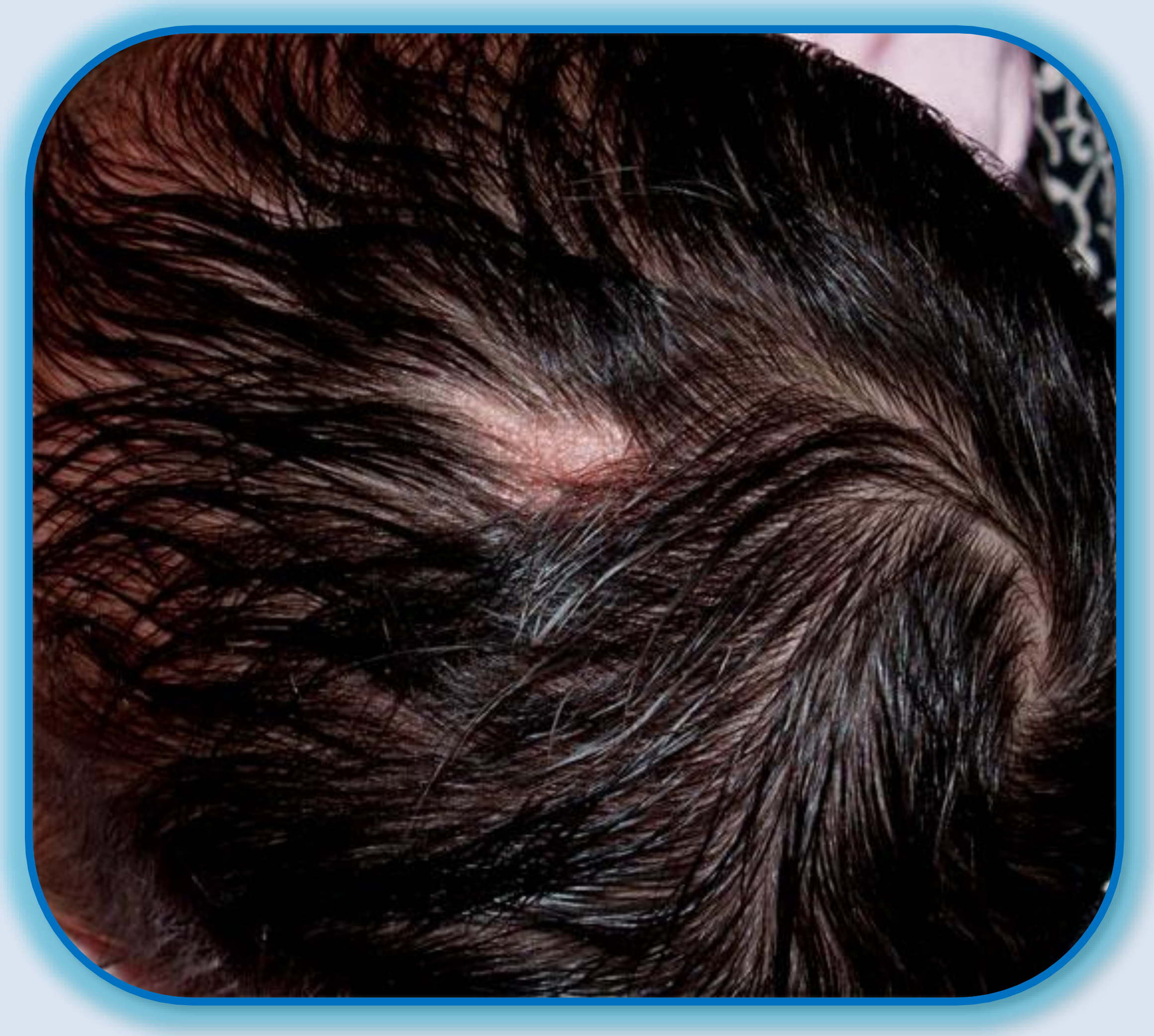


This lesion was present at birth. The lesion is **firm and papular** without any evidence of inflammation. This is consistent with an epidermal nevus.

With time, epidermal nevi usually become more wart-like and scaly.

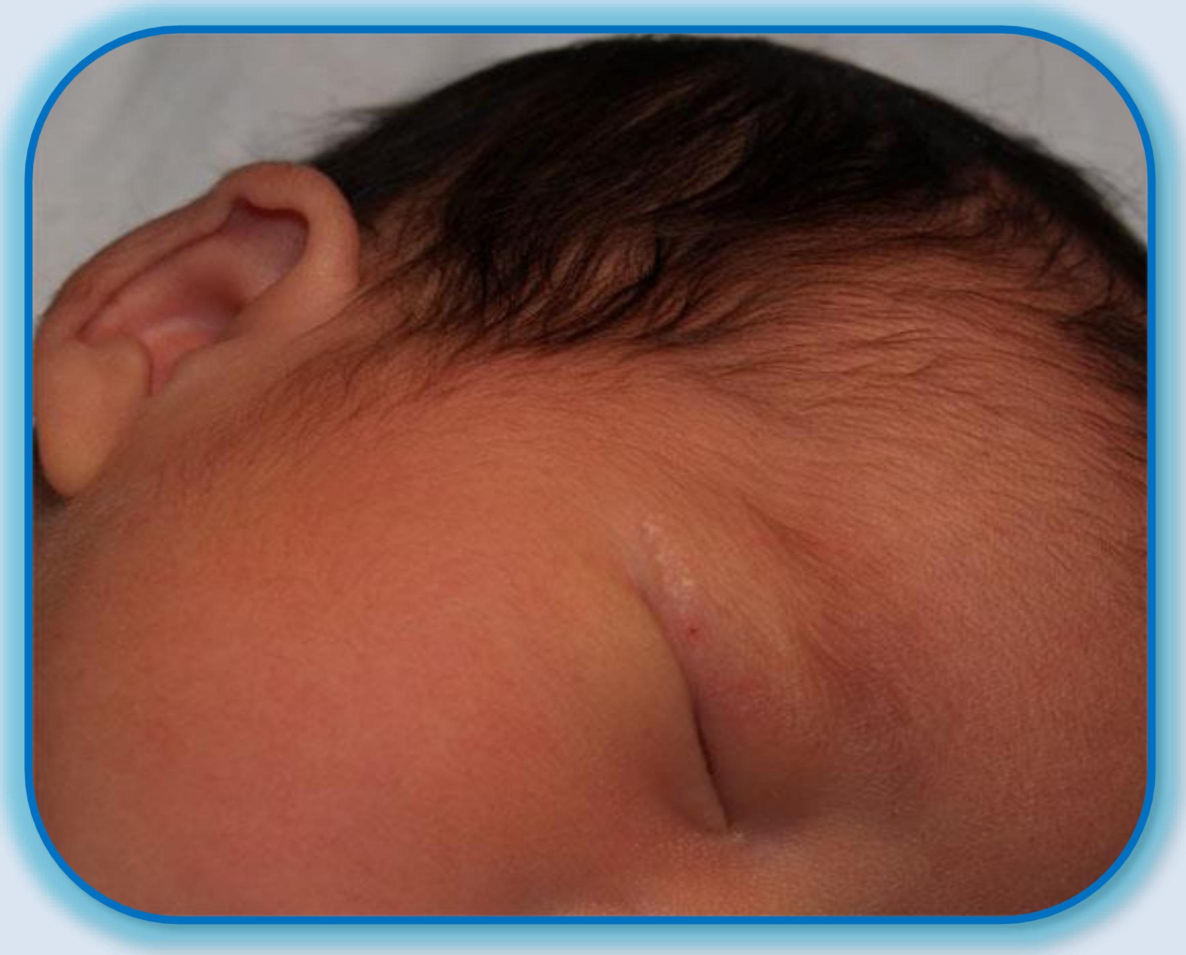
Patients with epidermal nevi may have **associated CNS, bone, and eye abnormalities**, but this is more likely in those with extensive lesions.

Sebaceous Nevus



A sebaceous nevus **(SN of Jadassohn)** is a **yellow-orange, waxy, pebbly** lesion present on the face or scalp of some newborns. Hair follicles are not present within the lesion itself, but lesions on the scalp may be covered over by surrounding hair.

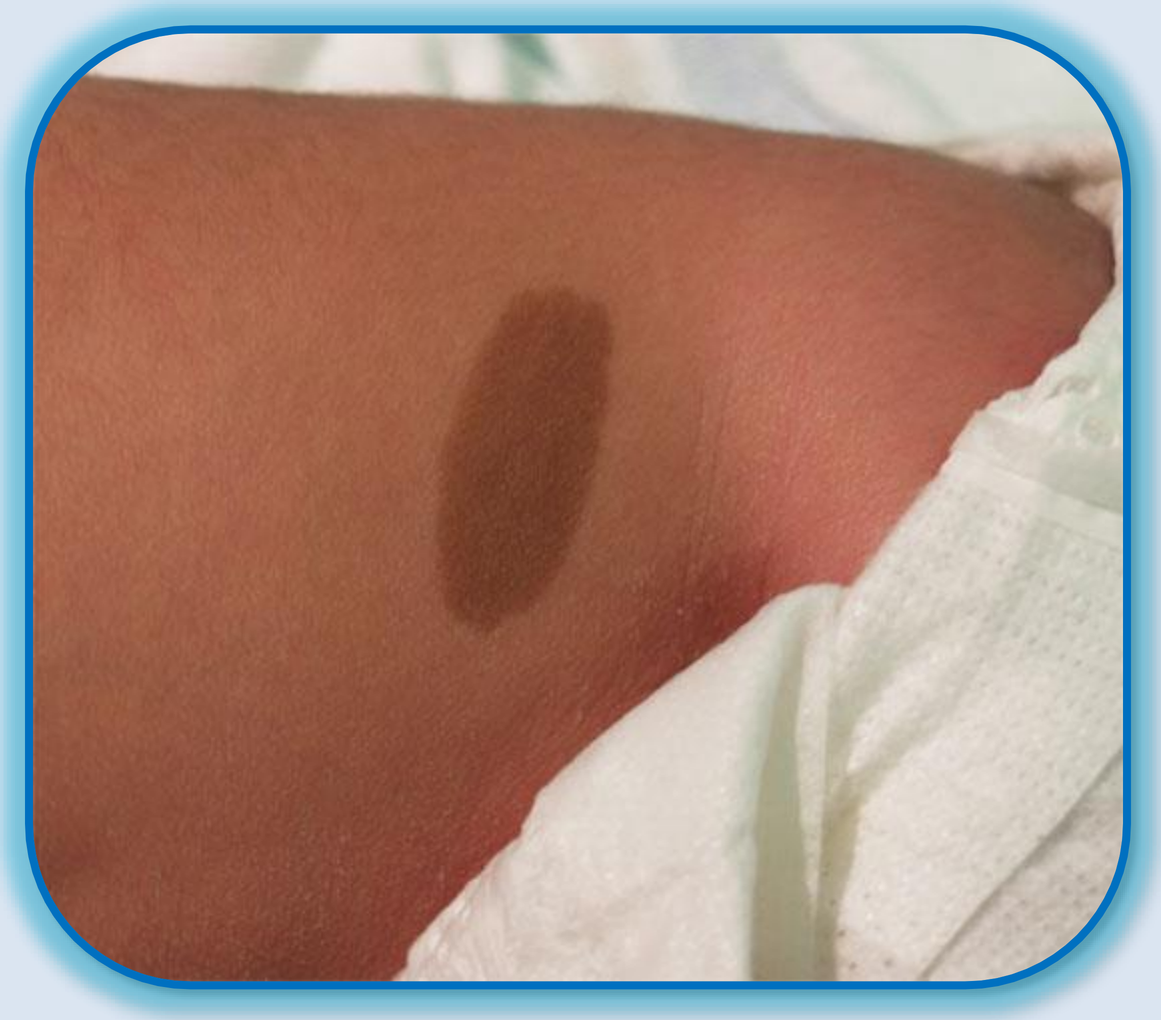
Sebaceous Nevus



Here is another example of sebaceous nevus on the lateral margin of the eyelid. The significance of this finding is primarily related to the fact that it is **sensitive to the androgens** produced during puberty, causing the lesion to become larger and more wart-like, so elective removal may be considered at that time.

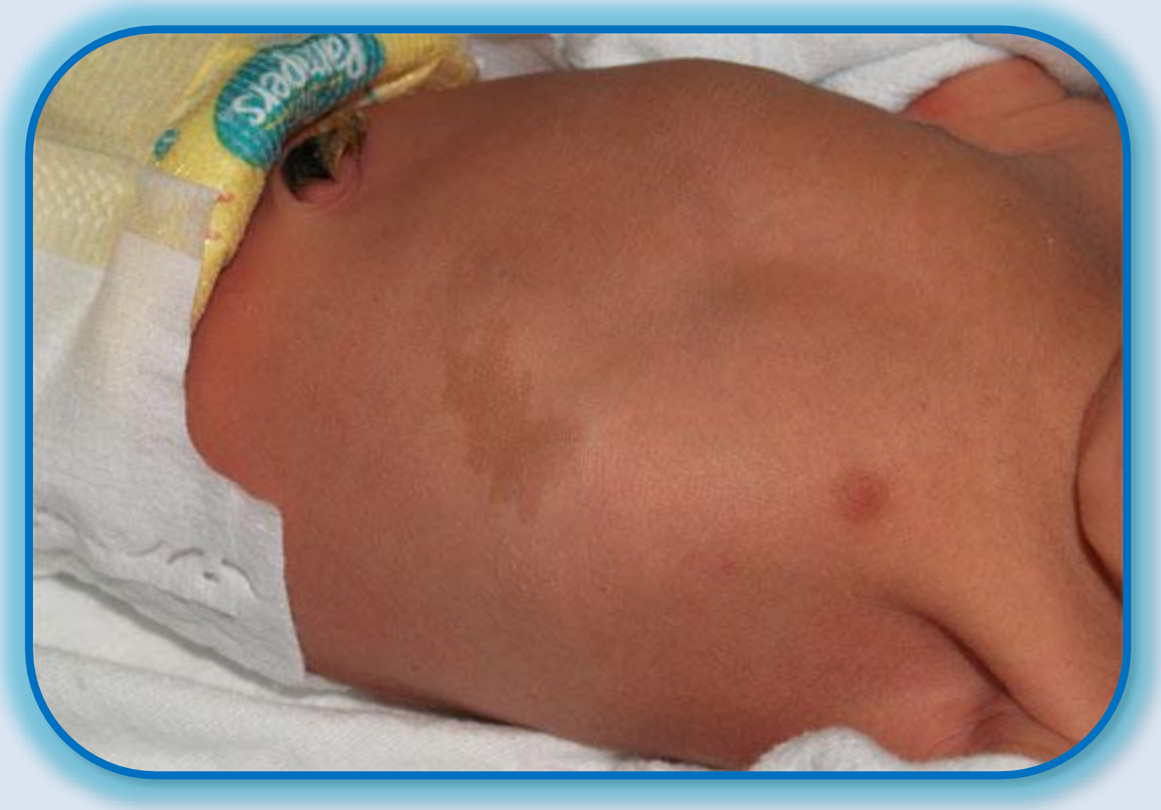
Almost all of the changes that occur within these lesions are benign, but there are a few reports of basal cell carcinomas in older adults, so observation throughout life is important.

Junctional Melanocytic Nevus



The typical lesion is completely **flat** and is medium to **dark brown** in color. It may be present at birth. It may become slightly raised as the infant grows and may become a compound nevus if intradermal melanocytes develop. It is considered a **benign** lesion.

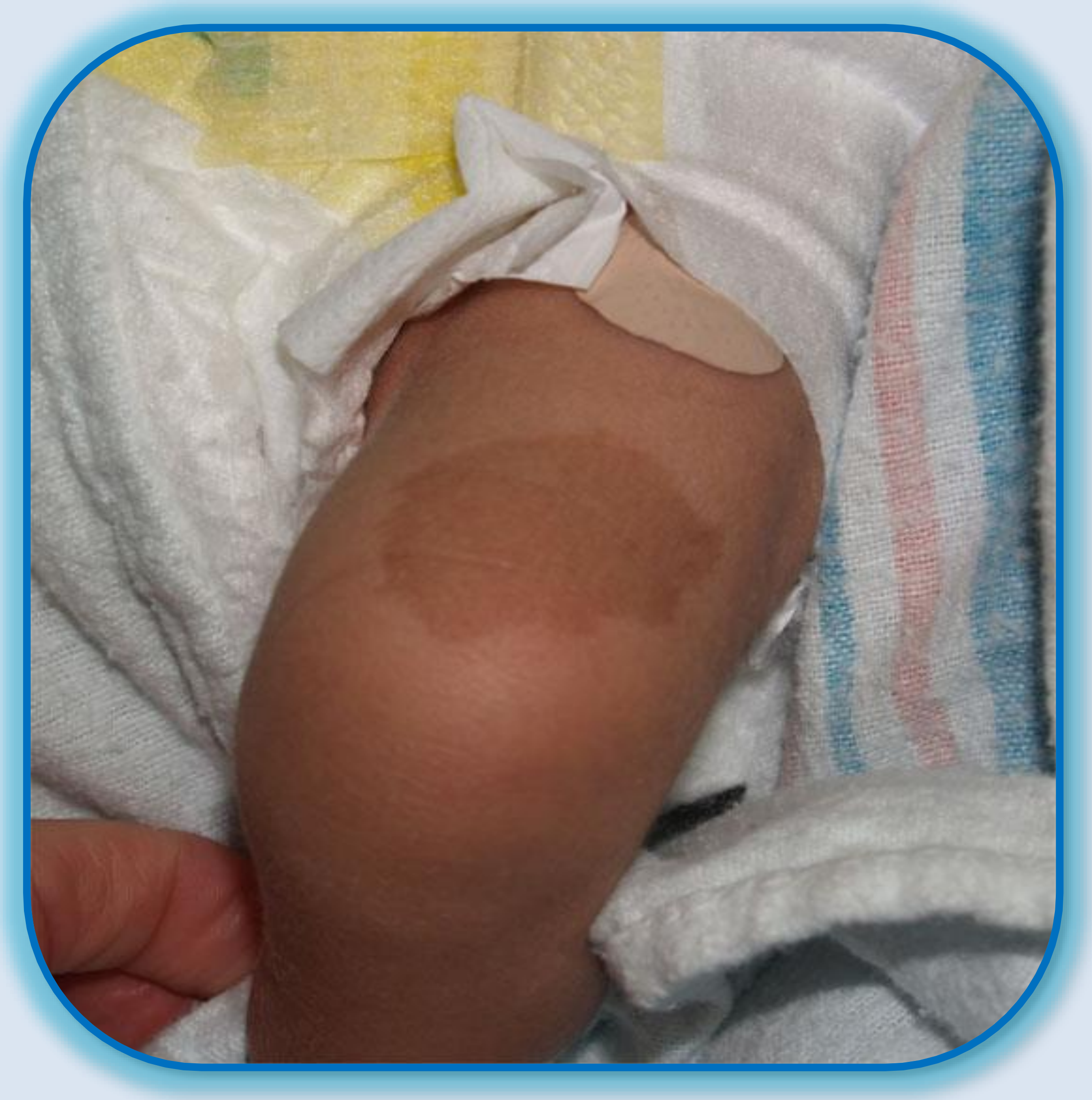
Cafe Au Lait Spot



Cafe au lait spots are **lighter in color than melanocytic nevi**, but they also may be congenital macules. They are caused by an increased amount of melanin in both melanocytes and epidermal cells, and may increase in number with age.

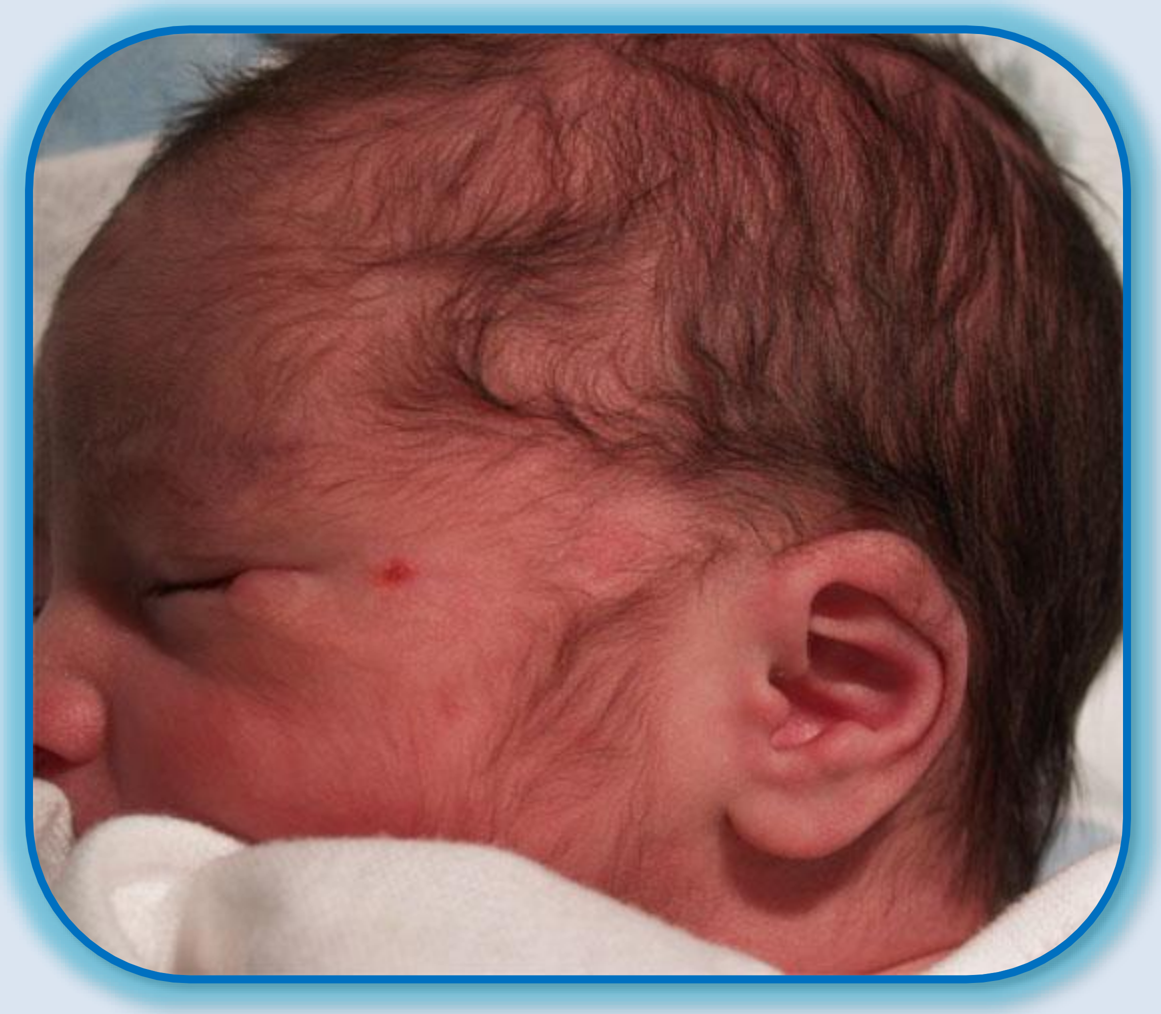
Most children with cafe au lait spots do not have **neurofibromatosis**, but the **presence of six or more of these spots that are larger than 0.5cm** diameter is considered to be a major clue to the diagnosis.

Cafe Au Lait Spot



Here is another example of cafe au lait spot. Again in this patient, the spot was an isolated physical finding, so no further evaluation was necessary.

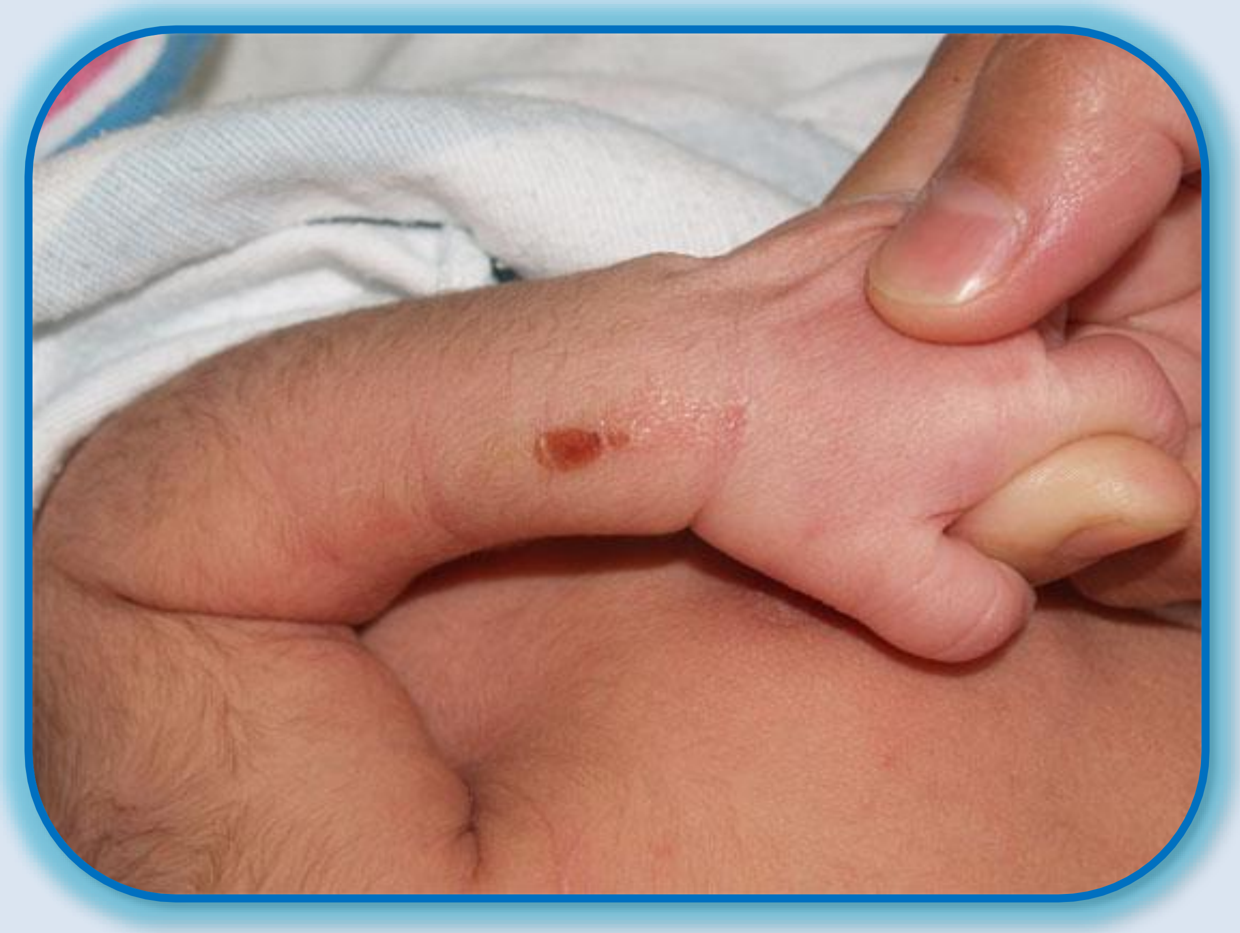
Cutis Aplasia



On examination of this infant, there were 3 areas of abnormality (the nodule under the left eye, the red "excoriated" area lateral to the nodule, and the hairless, circular lesion anterior to the ear). The etiology of the nodule is unknown at this time, but the other two areas were felt to be consistent with cutis aplasia.

Cutis aplasia is often thought of in **association** with **trisomy 13**, but it can also be an **isolated** finding in an otherwise well newborn.

Sucking Blister

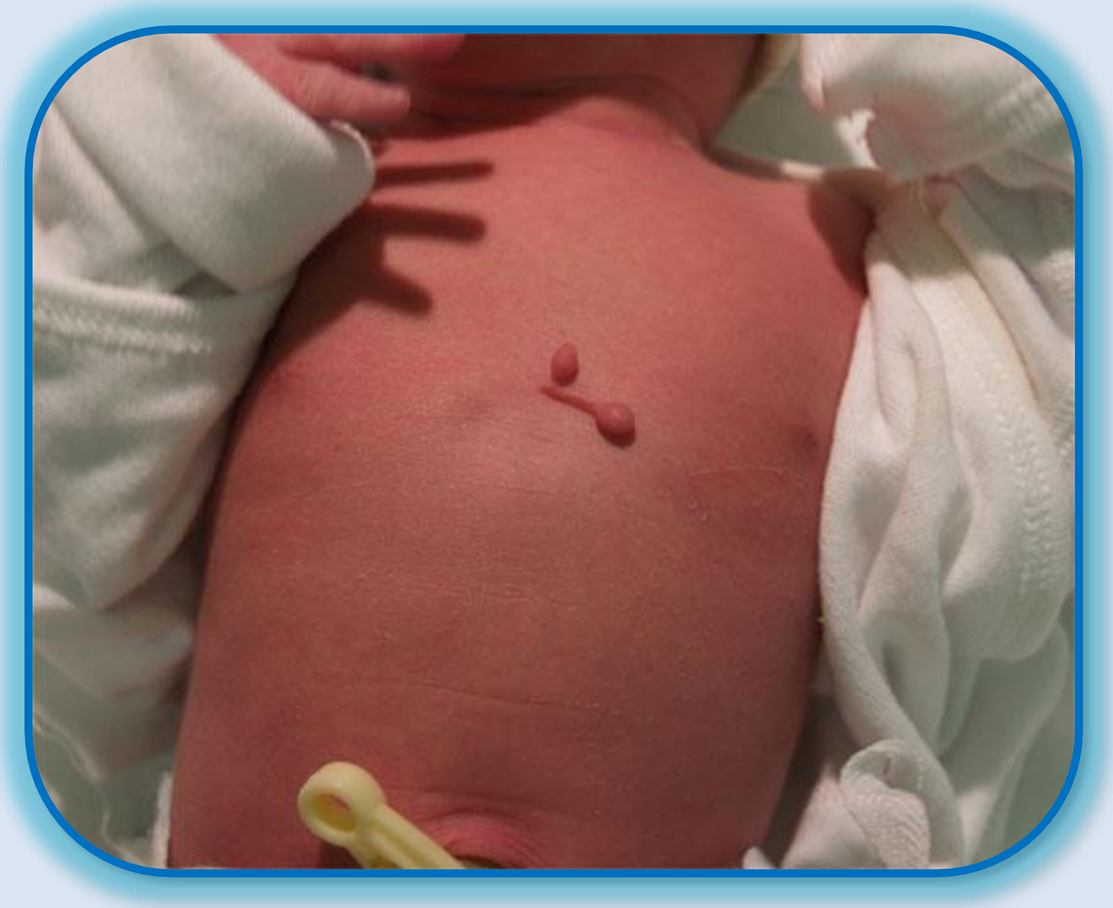


This lesion is fairly typical of the appearance of a sucking blister **at birth**. It is created by the infant sucking on his extremity.

Sucking blisters are **solitary** lesions that occur only in areas accessible to the infant's mouth. They are **benign** and **resolve spontaneously**.

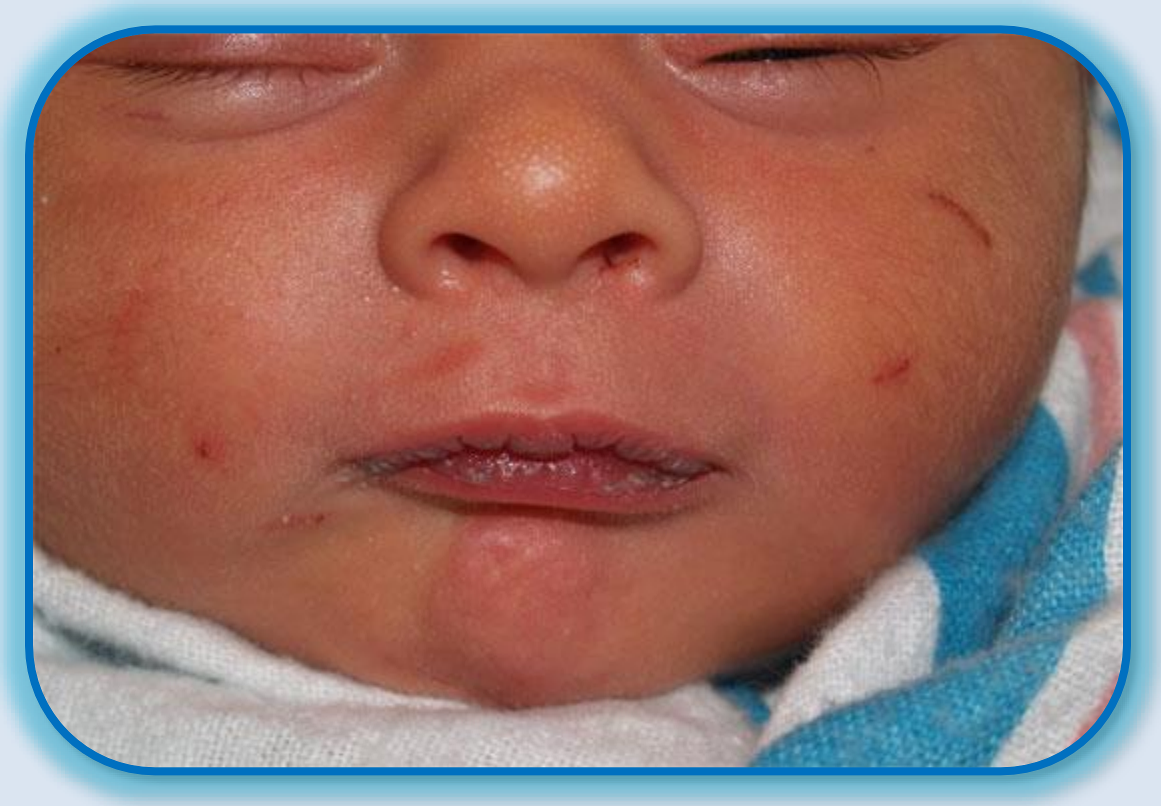
The appearance and location of the lesion is usually sufficient for diagnosis, but if the infant is observed sucking on the affected area, the diagnosis is certain.

Skin Tags



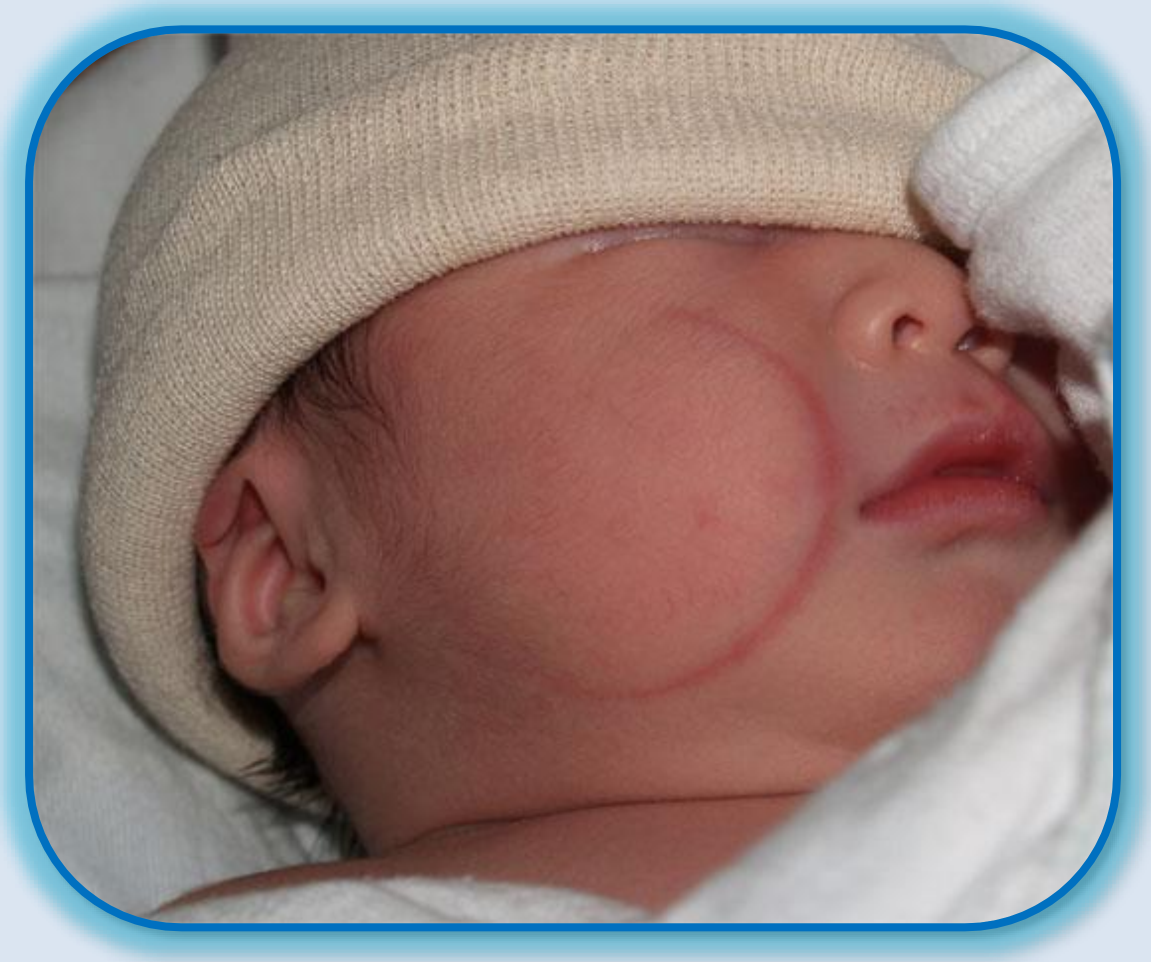
These tags are rather typical in appearance, but in an unusual location. Because of the narrow diameter of the stalk, the decision was made to clip these with scissors instead of tying them off.

Fingernail Scratches



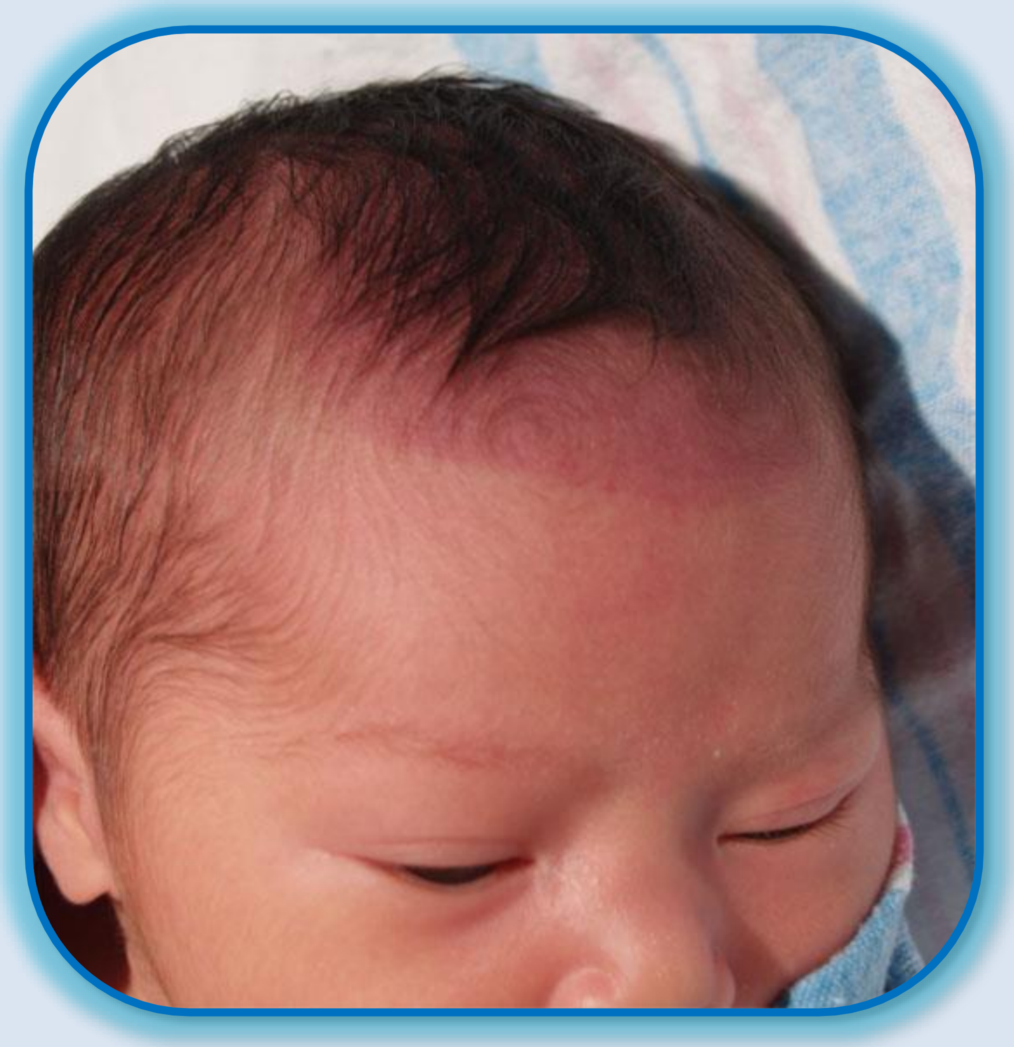
Self-inflicted fingernail scratches are common. In this infant, two linear scratches can be clearly seen on the patient's left cheek and several other minor scratches are also visible. In an effort to prevent scratches, the hands of a newborn are frequently covered with long sleeves, mittens or socks.

Forceps Mark



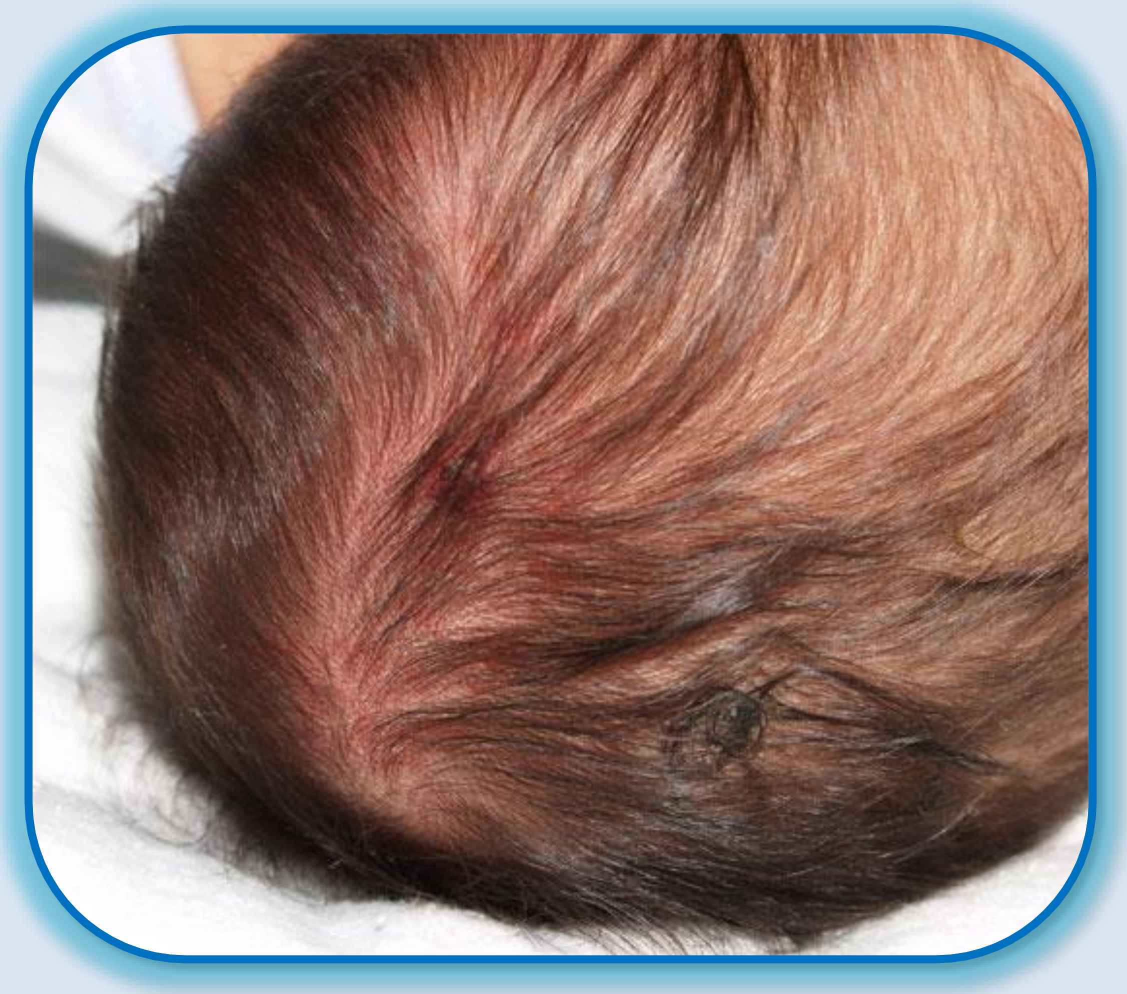
When forceps are needed to assist a delivery, this type of semi-circular, superficial red mark can occasionally be seen on the sides of the infant's face. These marks have **no consequence** and will **spontaneously resolve**. In rare cases when the skin is abraded, antibiotic ointment may facilitate healing.

Vacuum Mark



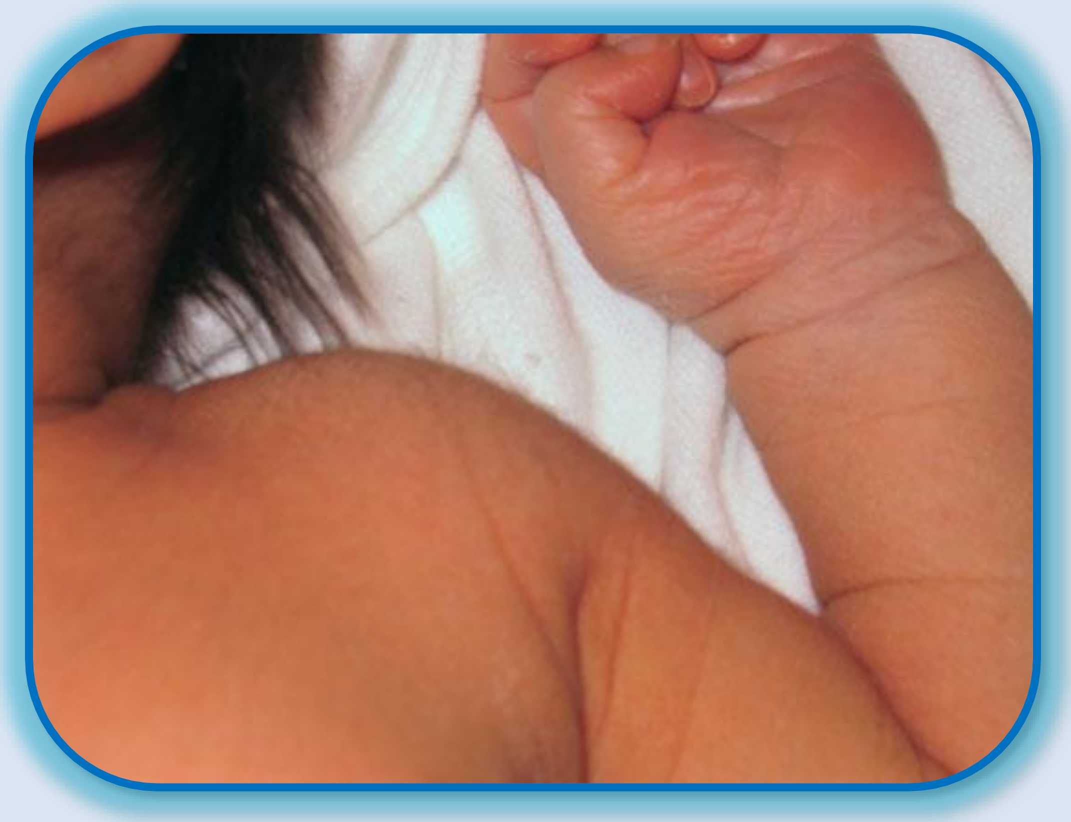
Vacuum extraction can also leave marks on the infant's head. Typically, the bruising is similar to that which occurs normally during the process of delivery except for the fact that it is **well circumscribed**. In some cases, however, the bruising **can be** more severe with associated blisters or sloughing of the skin, or with underlying cephalohematoma or subglaeal hemorrhage. In this infant, the bruising is fairly mild, but can be easily seen because it extends beyond the hairline in the front. This finding **spontaneously resolved**.

Scalp Electrode Site



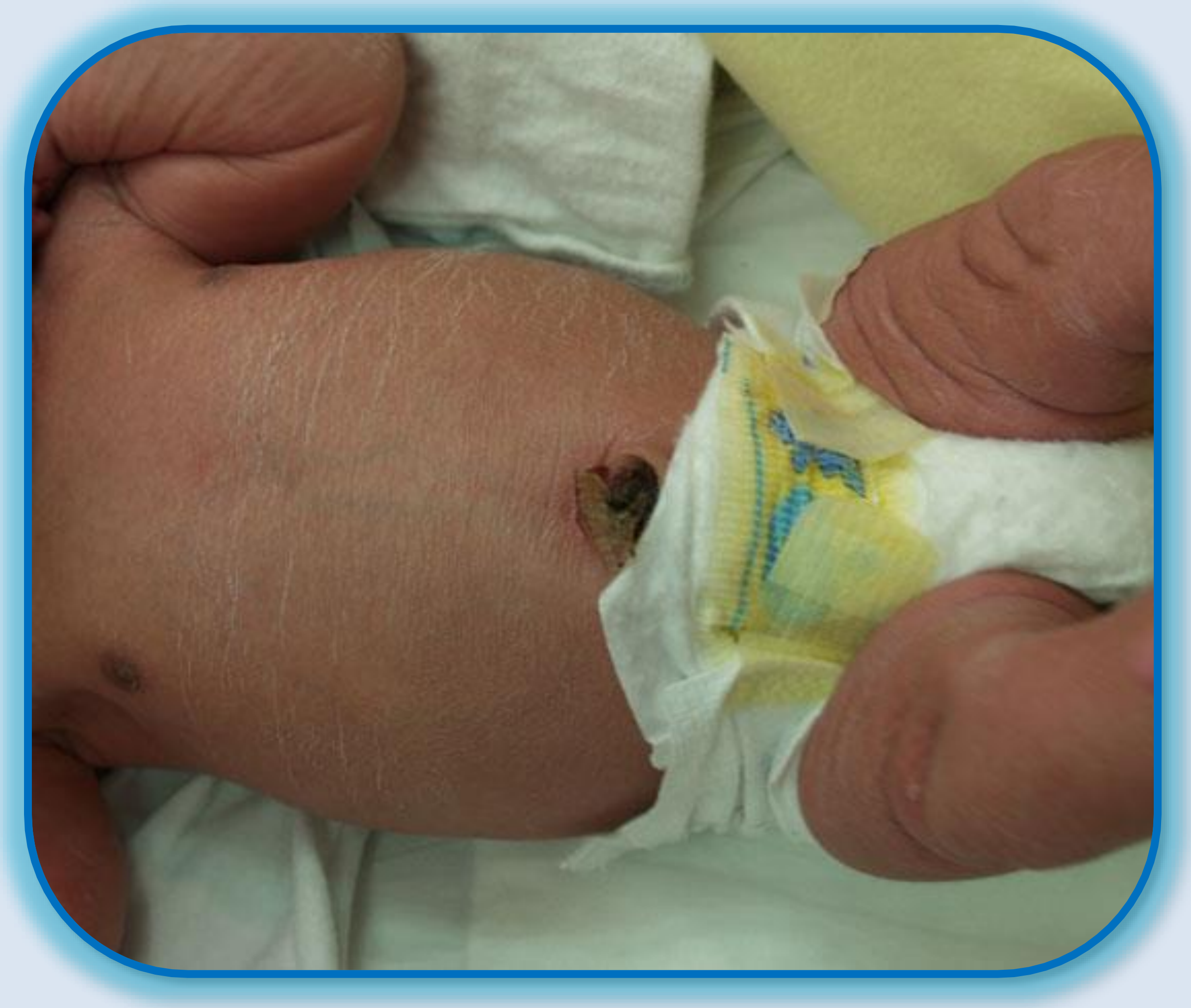
When a scalp electrode is used for internal monitoring prior to delivery, a small circular scab can often be seen at the site where the monitor was. In this child, the scalp electrode site is the slightly red area with central darkness in the middle of the photograph.

Lanugo



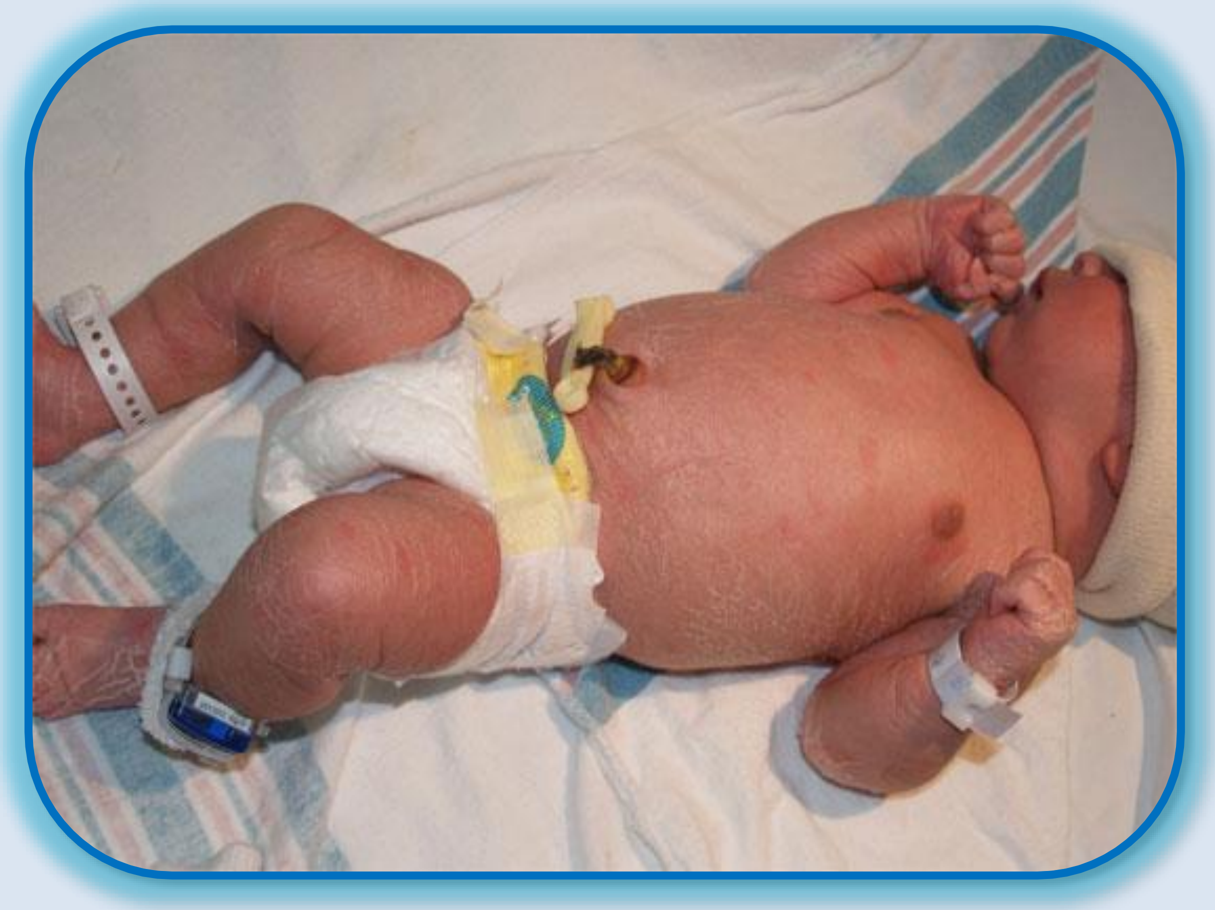
The downy hair seen over the shoulder is lanugo. Although this is present to a much greater degree **in premature** infants, term babies also have variable amounts of lanugo present at birth, as evidenced in this photo.

Normal Peeling



A **dry, flaky**, peeling appearance of the skin is **very common** in newborns. Although this can be distressing to parents, it does not need treatment and will **spontaneously resolve**.

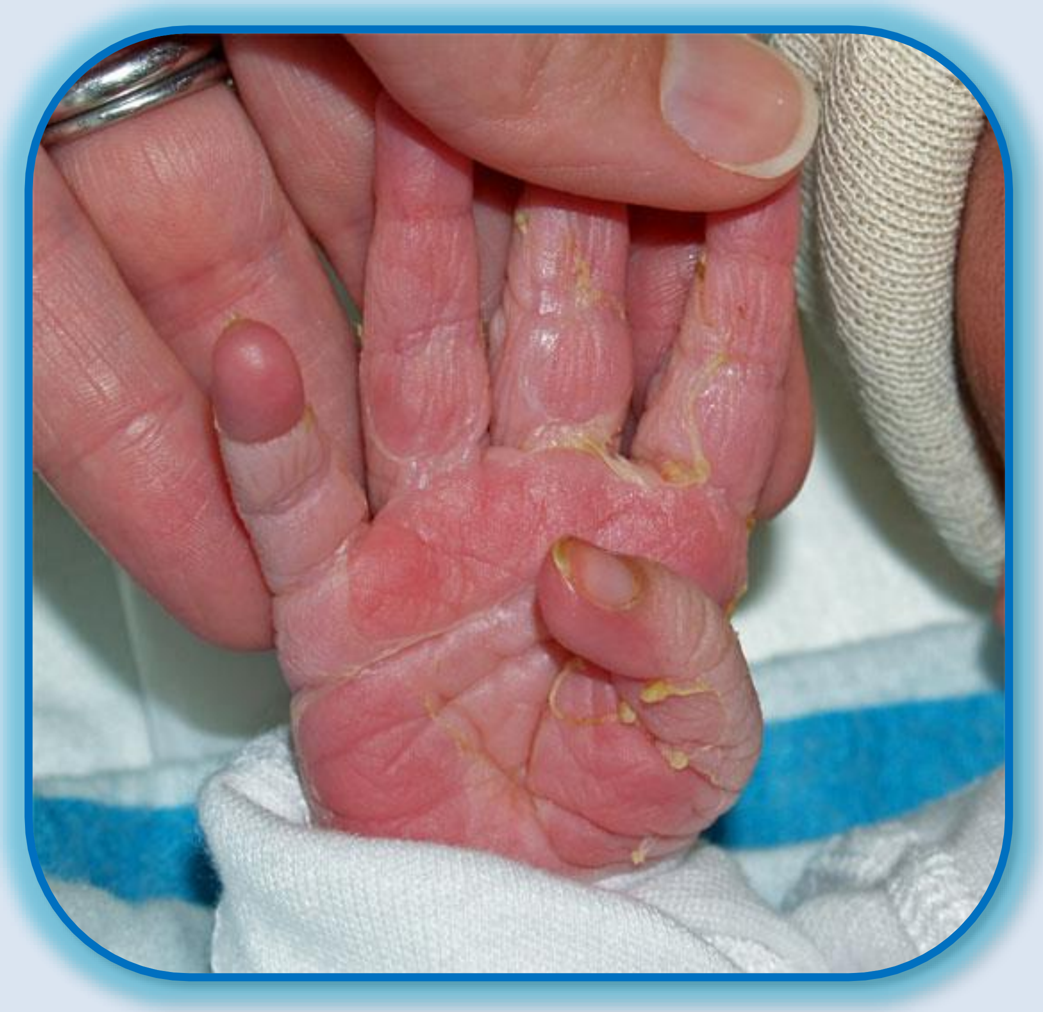
Normal Peeling



This is another example of a **post-dates** infant with dry, peeling skin. On the day of birth, the skin of this baby had a very **leathery** appearance. This photograph was taken on the second day, when the skin had dried out and the peeling was more visible.

The red blotches visible on the chest, right forearm, and legs are erythema toxicum and are unassociated with the peeling.

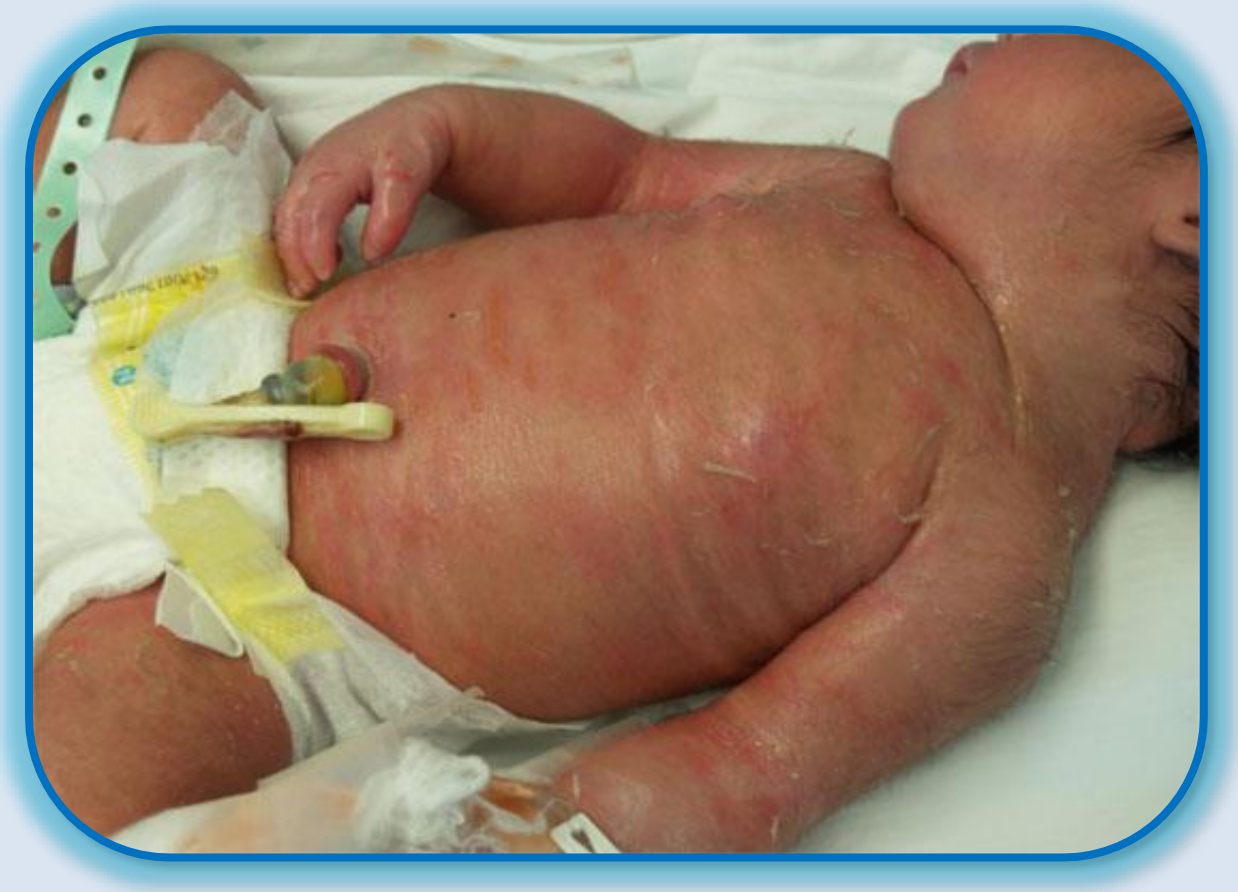
Normal Peeling



The hands and feet are especially **common** places to observe peeling. Often associated with infants who are **postdates**, many term babies exhibit this kind of peeling as well.

In this patient, the skin and nails are stained yellow from the presence of meconium in utero.

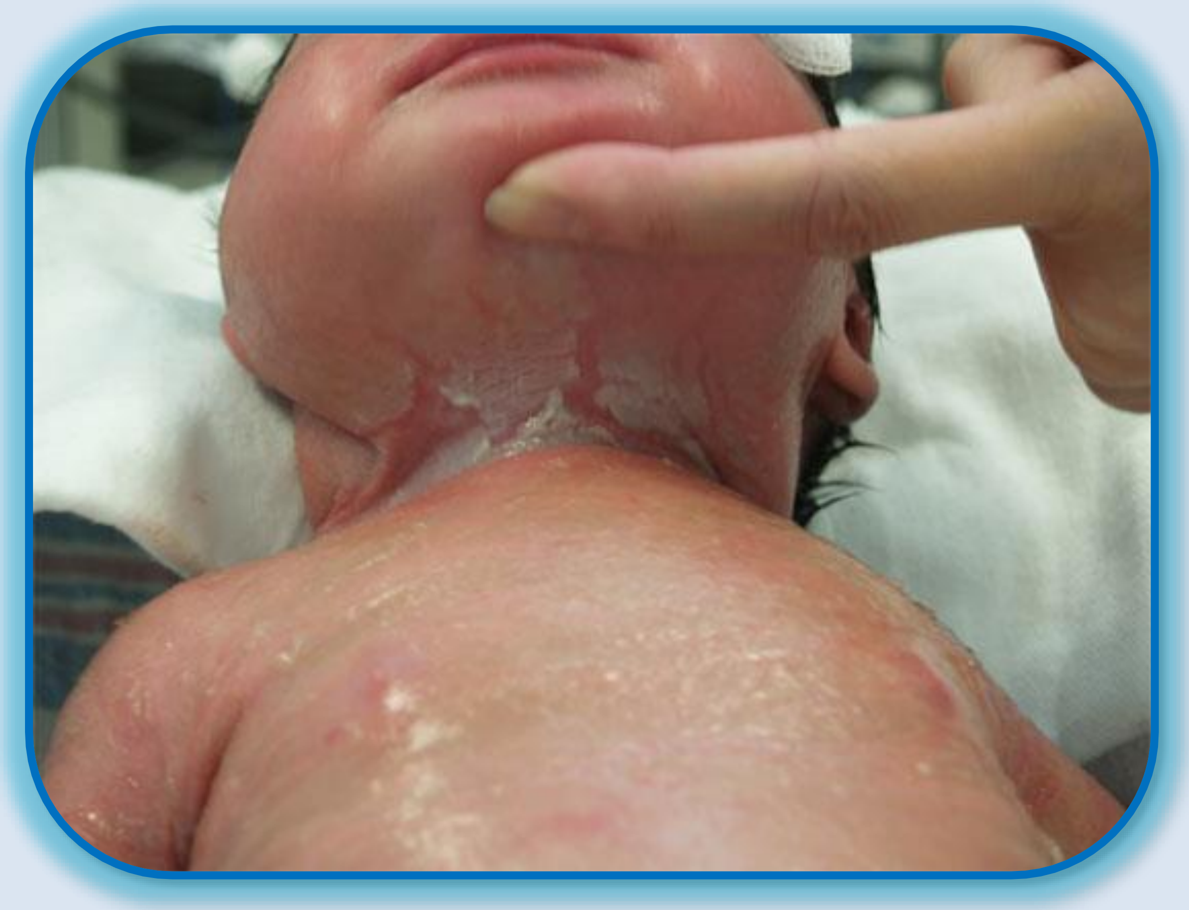
Icthyosis



In contrast, this type of peeling is **not normal**.

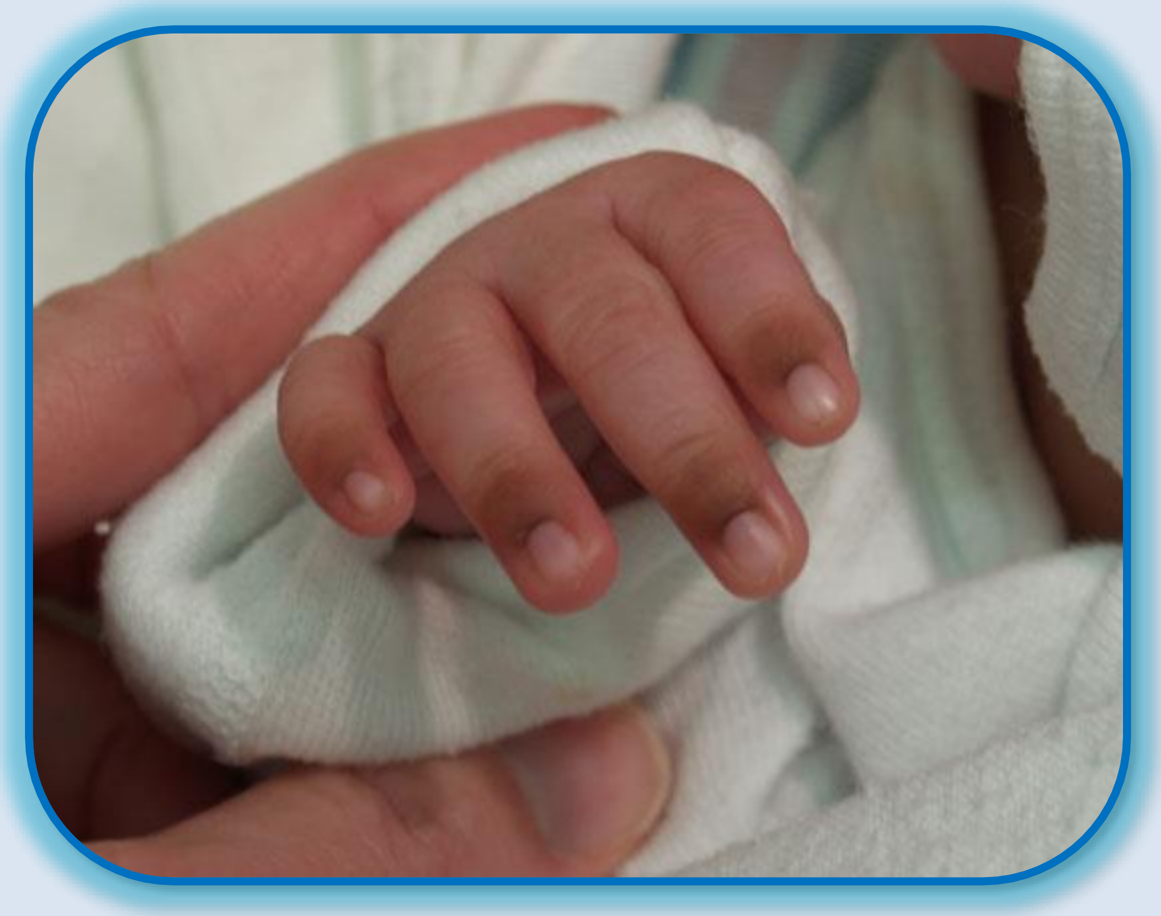
Notice how the **skin under the peeled areas is red and fissured** and how the **fingers** on the right hand appear **edematous**. This newborn had an uncomplicated pregnancy and delivery, but this skin appearance in the delivery room prompted transfer to the NICU for further evaluation. For this baby, **Aquaphor** was liberally applied to the skin, and the infant was kept in an **isolate to minimize fluid losses**.

Icthyosis



This is the same infant as in the previous photo. Here, deeper **fissuring** can be seen in the area under the chin. Involvement of both pediatric dermatologists and geneticists is appropriate when dealing with congenital icthyosis.

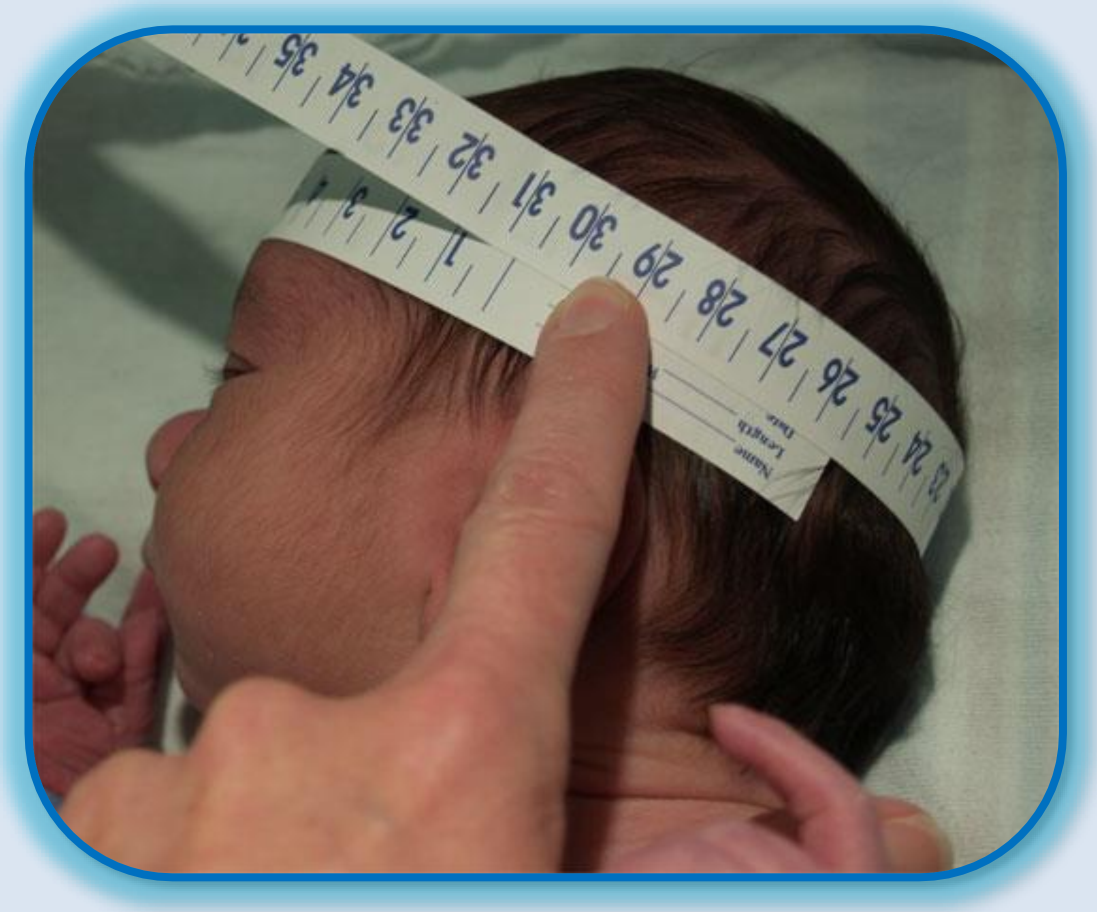
Normal Skin Pigment



The increased pigment seen at the base of the nails is this African-American infant is entirely normal. When the parents' skin tone is dark, the overall skin tone of the baby will typically be much lighter than the parents at birth. The increased melanin can be seen in some areas like, around the nails, over the helix of the external ear, around the umbilicus, and over the genitalia.

Head

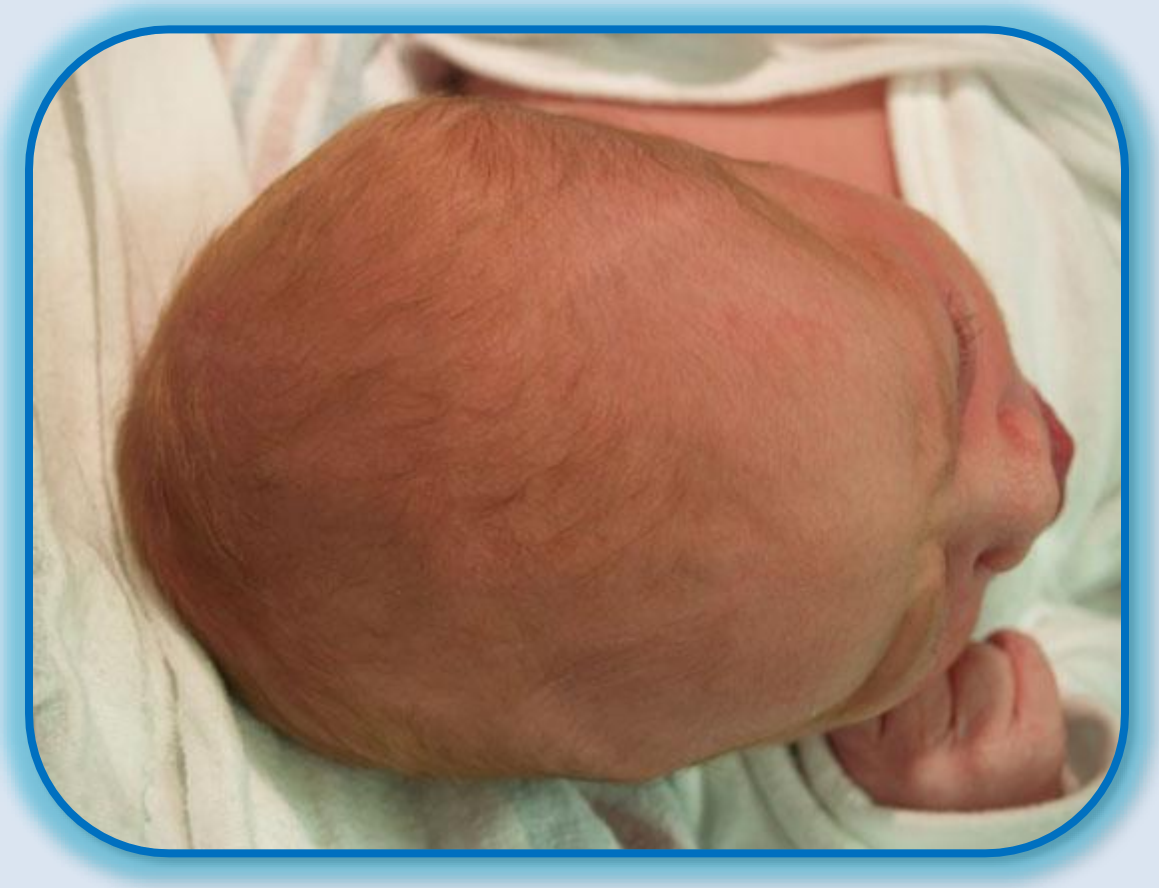
Head Circumference



One of the first things to assess when evaluating the head of the newborn is the Occipital Frontal Circumference **(OFC)**. This simple measurement may be the first clue to an underlying problem.

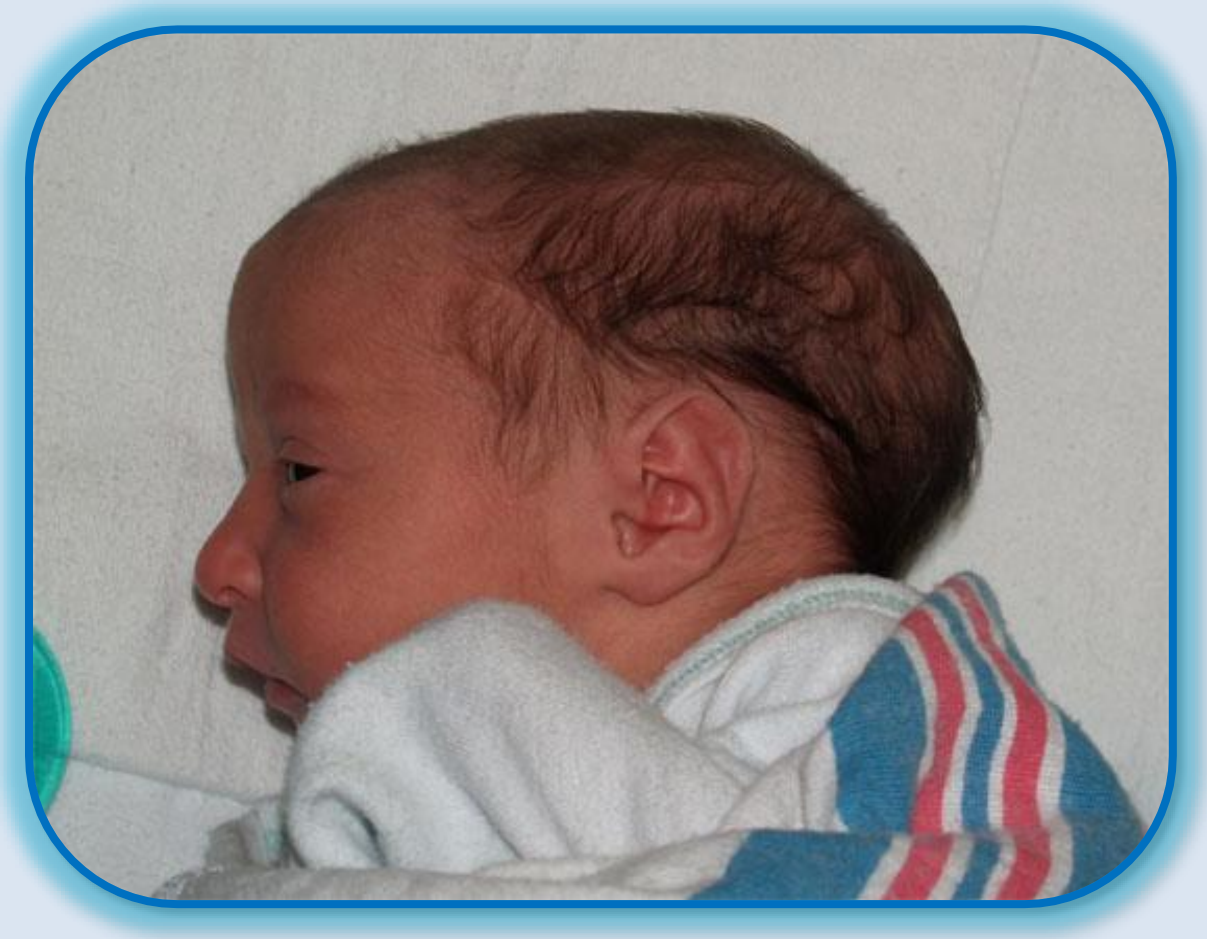
The 50th percentile for OFC of a term newborn is 34 cm, so for the infant above who had a normal weight and length for a term infant (near 50th %ile for age), a measurement of 30.5 cm is strikingly abnormal (<< 10th %ile for age). Further evaluation is indicated here; head imaging, screening for TORCH infection, and assessment for chromosomal abnormalities should all be considered.

Molding



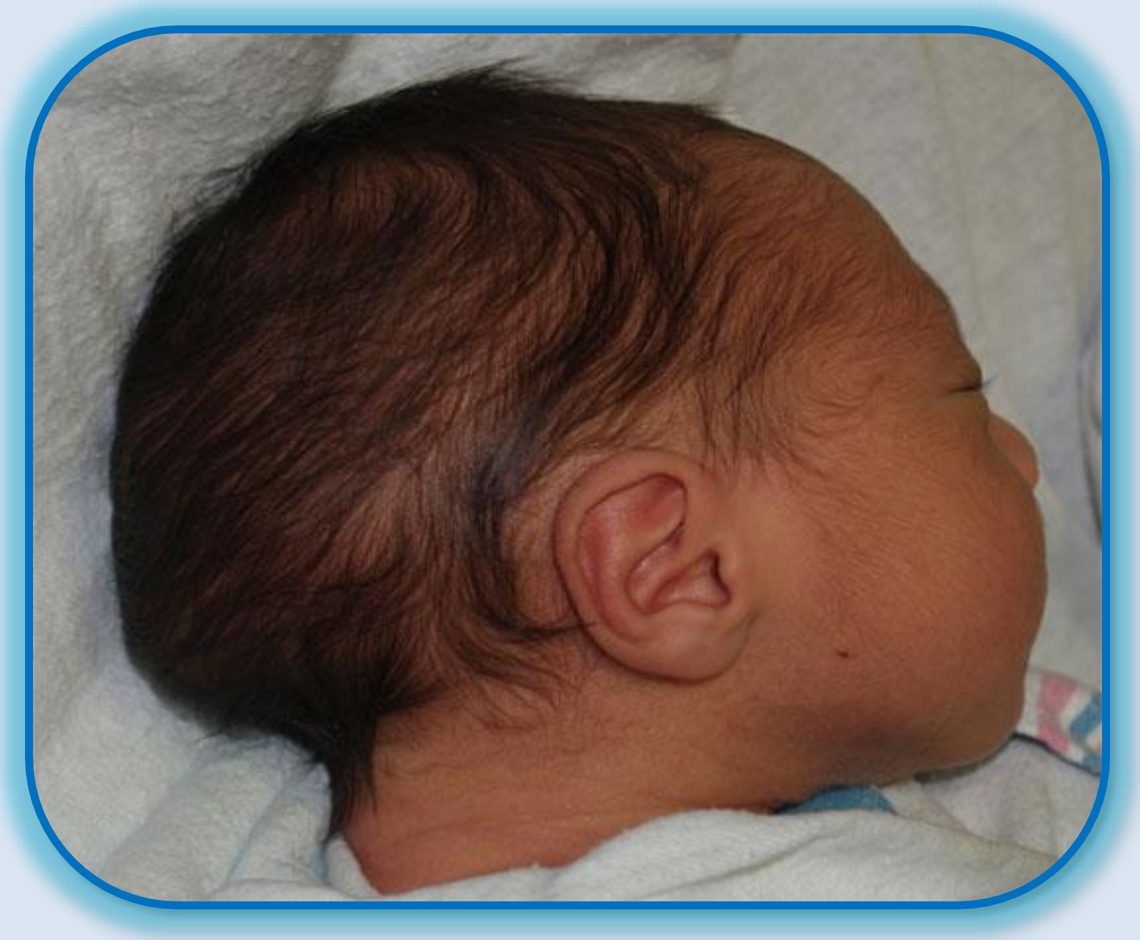
This picture shows what is usually noted primarily on **palpation**: the **ridges** that develop when one bone slightly overlaps the adjacent one during delivery. These **over-riding sutures** are part of molding. **Complete resolution** is expected with time.

Breech Molding



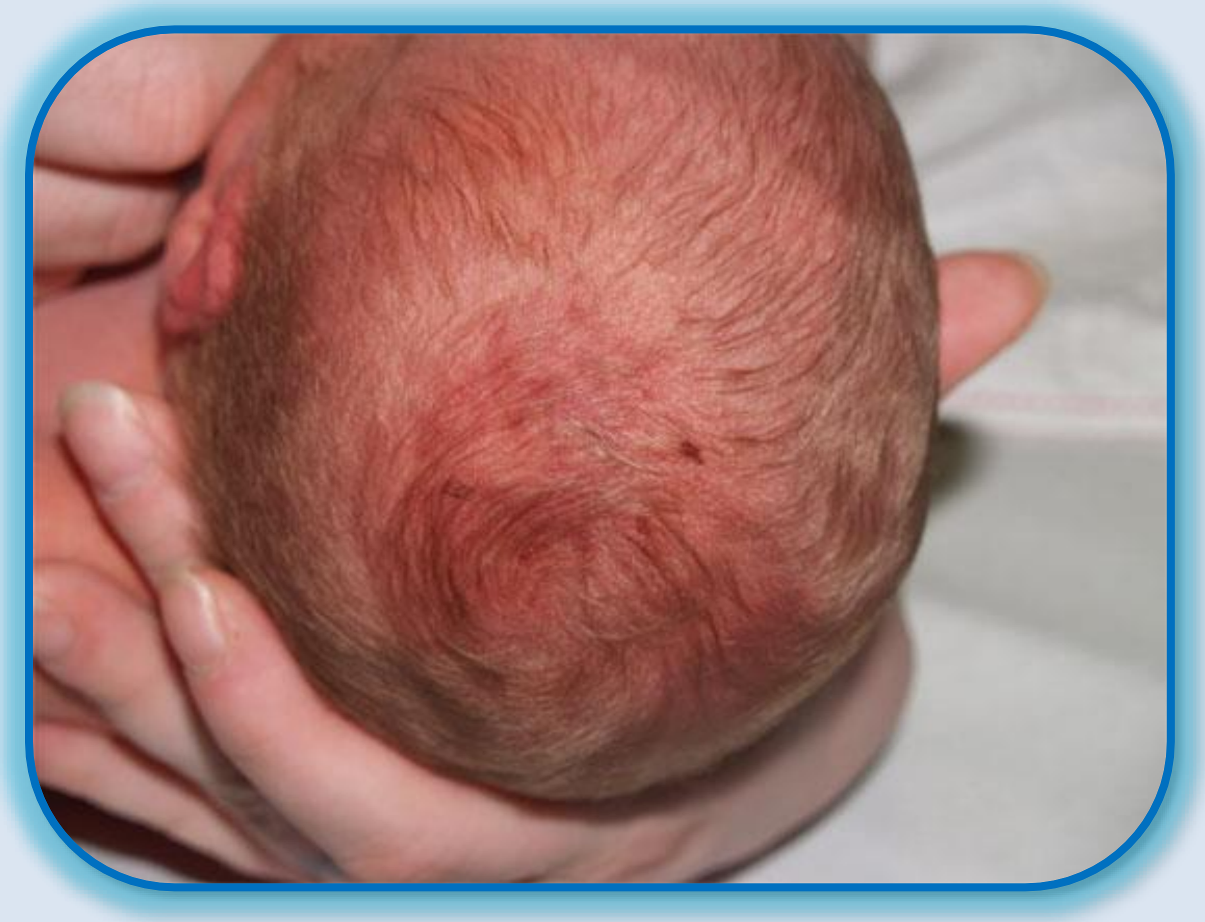
With breech positioning in utero, the head is in a position against the uterine fundus. This gives the newborn head molding that is flat on the top and elongated in AP diameter. As with any molding, this appearance will be **improved** significantly over the next **few days**.

Breech Molding



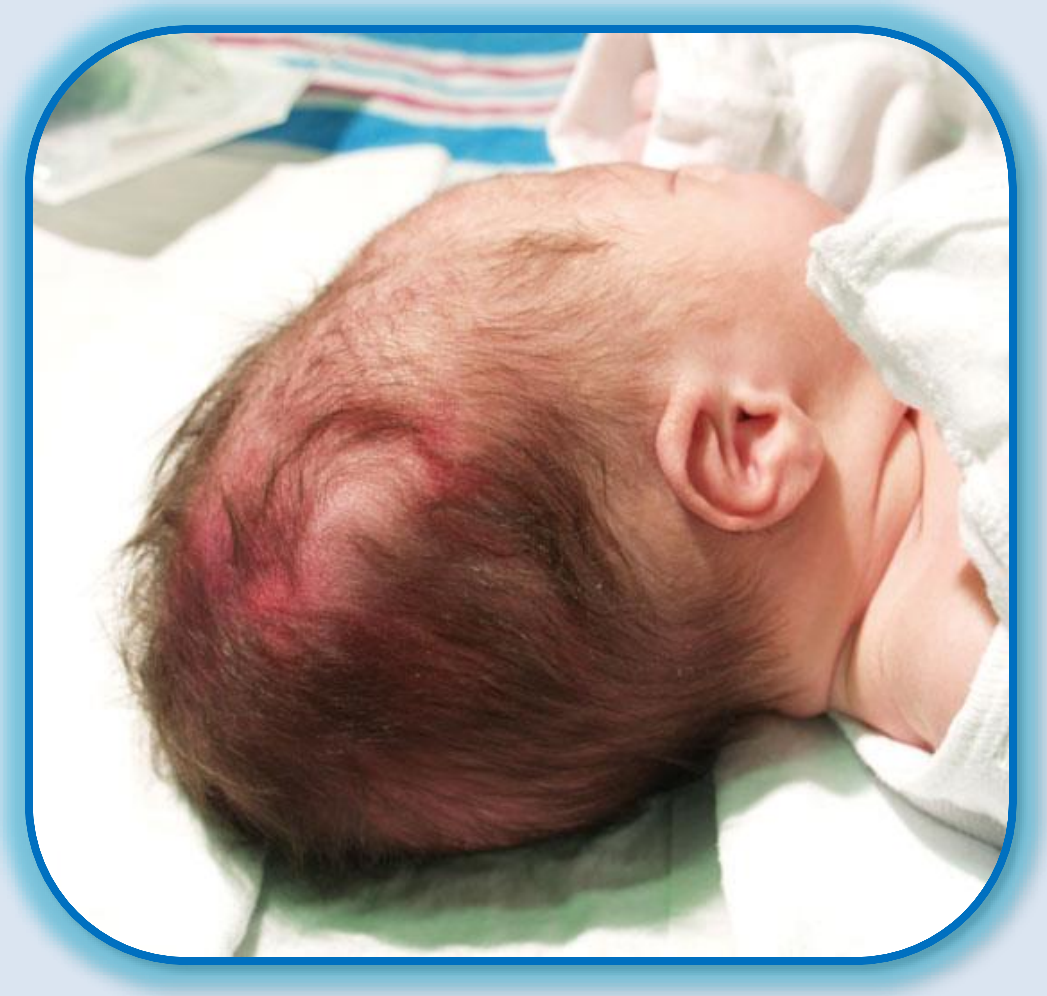
This is another example of the head molding that results when the infant has been in the breech position in utero. In this baby, the prominence of the occiput is particularly noticeable, but is not a cause for concern. Again, **spontaneous resolution** is expected.

Bruising



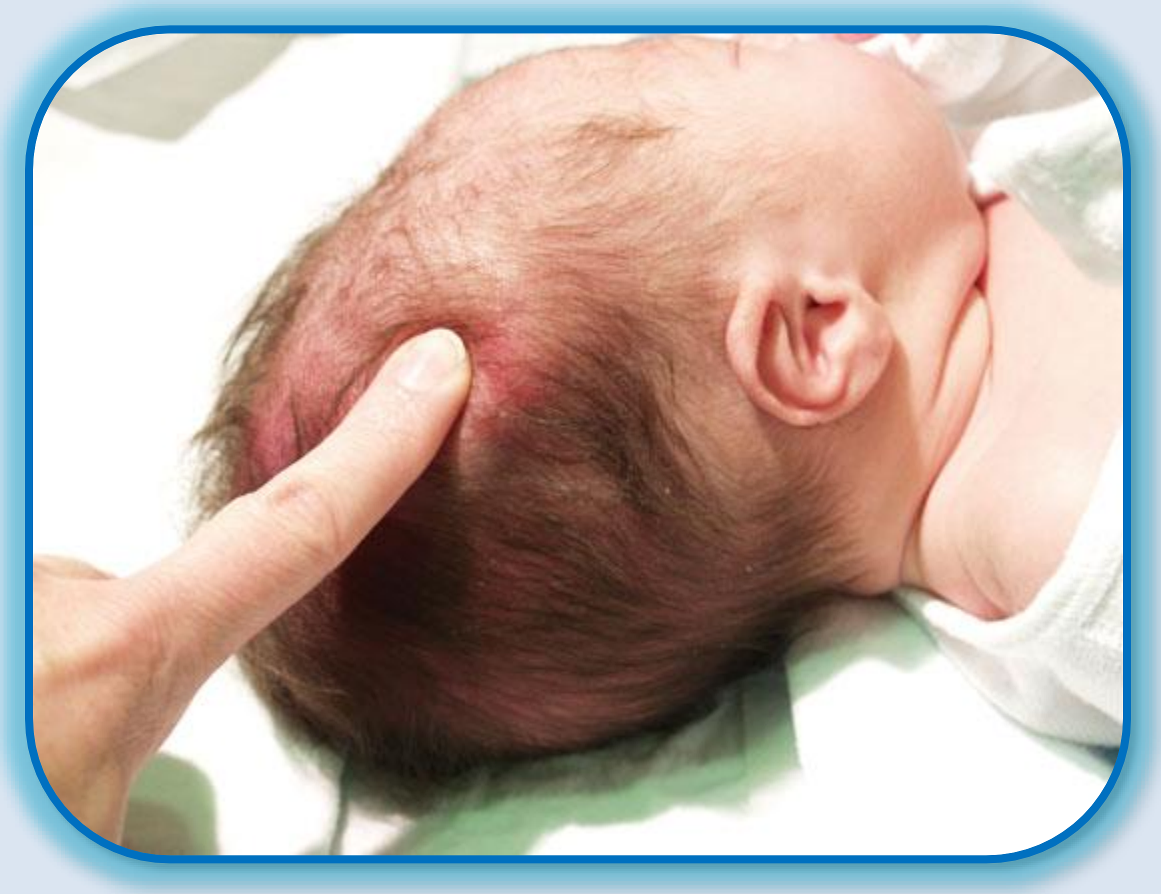
Bruising of the vertex of the head is a fairly **common** finding in newborns. The affected area may be rather large and may have various shades of red and blue. In some cases, traumatic blisters or bullae may be present. If a scalp electrode was used during delivery, a small scab is often visible is this area as well. **No treatment is required**.

Caput Succedaneum



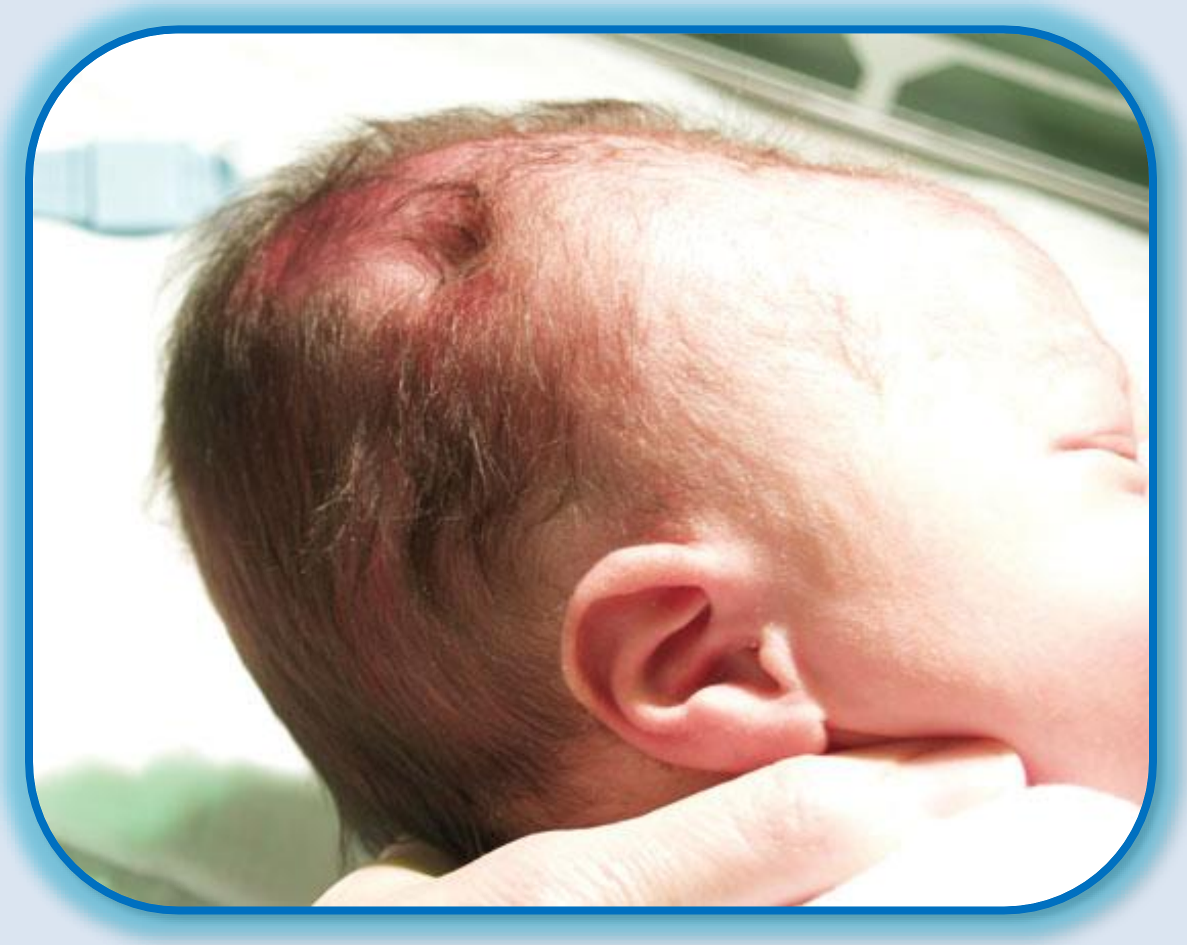
This photo was taken on the first day of life. There is some molding present here, but much of what is frequently mistaken for molding is caput **(scalp edema)**.

Caput Succedaneum



Firm, constant pressure in one spot is the easiest way to elicit the characteristic **pitting edema** of caput.

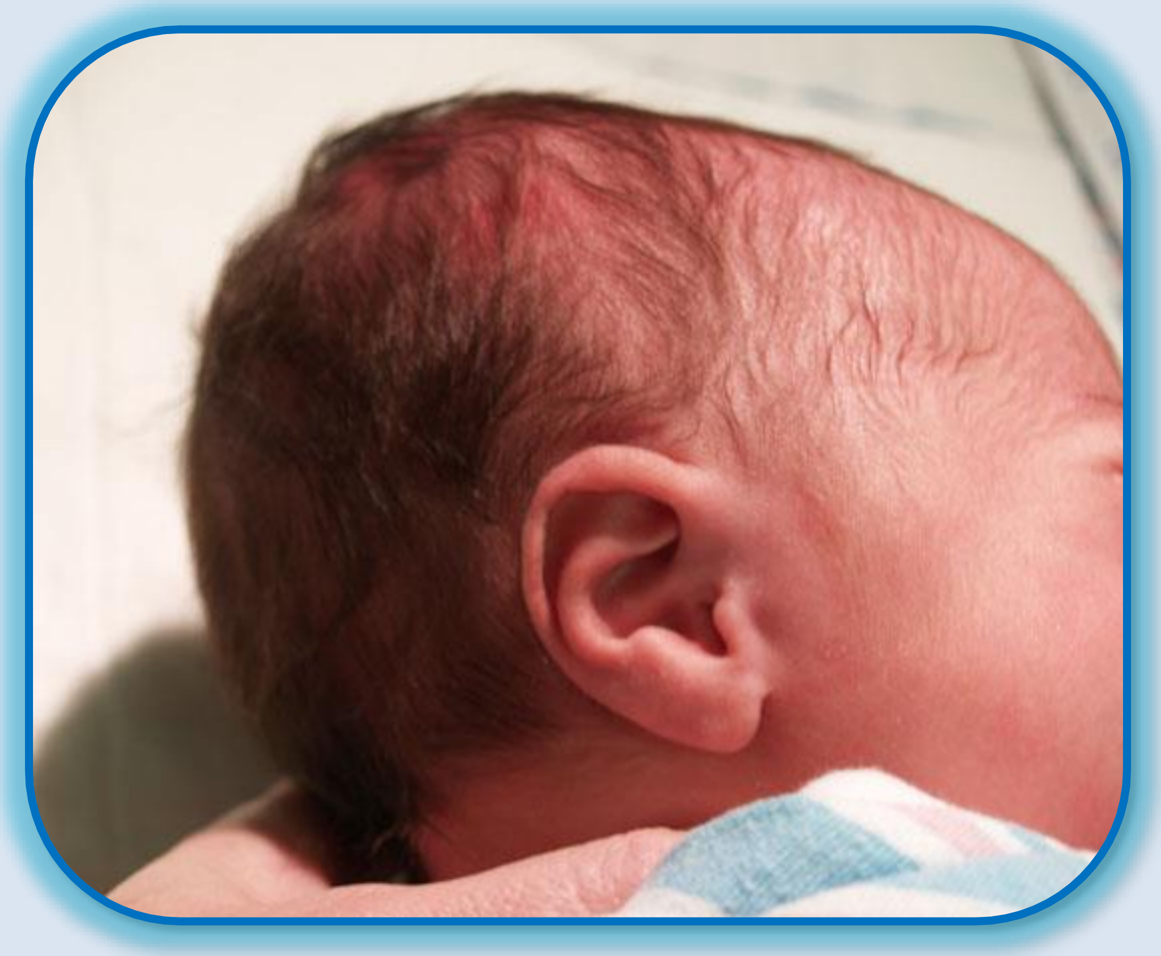
Caput Succedaneum



After the pressure is released, the pitting indentation is clearly seen. Although **caput can cross over suture lines**, it is often **predominantly unilateral**.

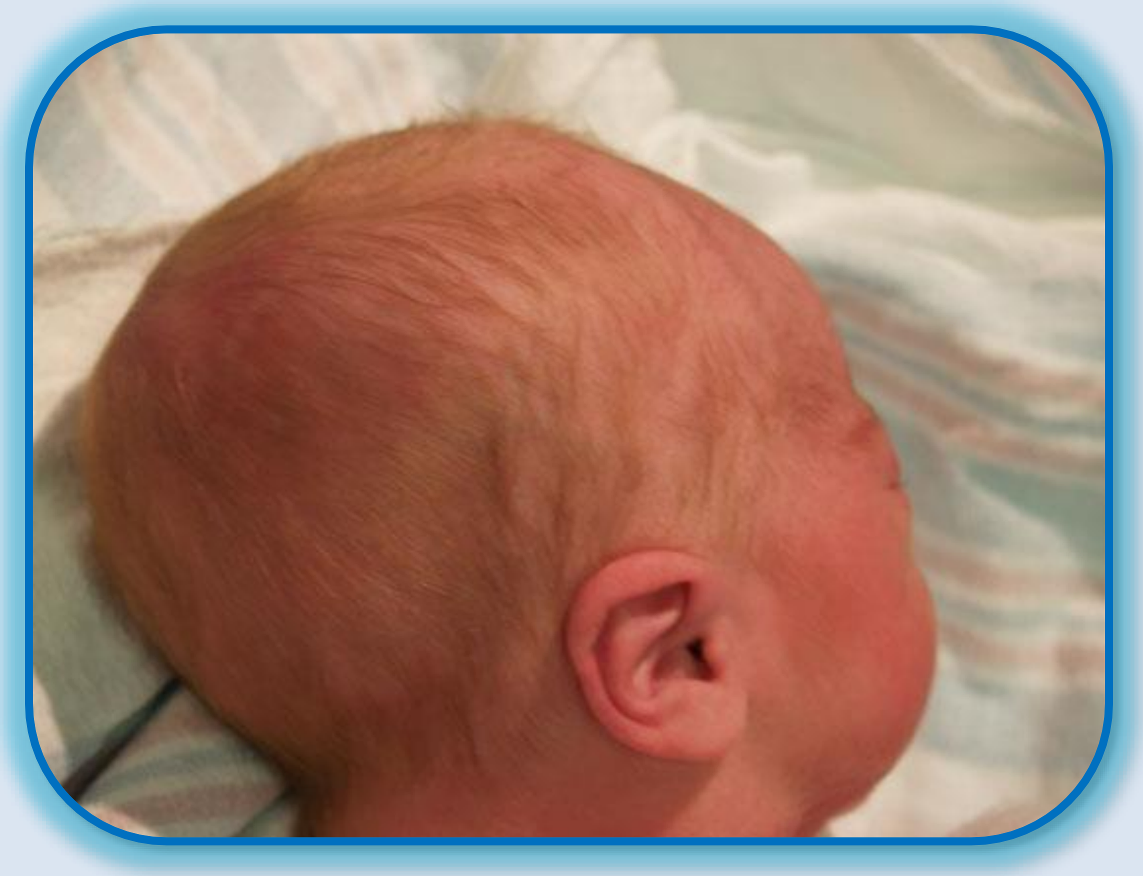
Evaluating for pitting edema is a much more useful diagnostic tool than location.

Caput Succedaneum



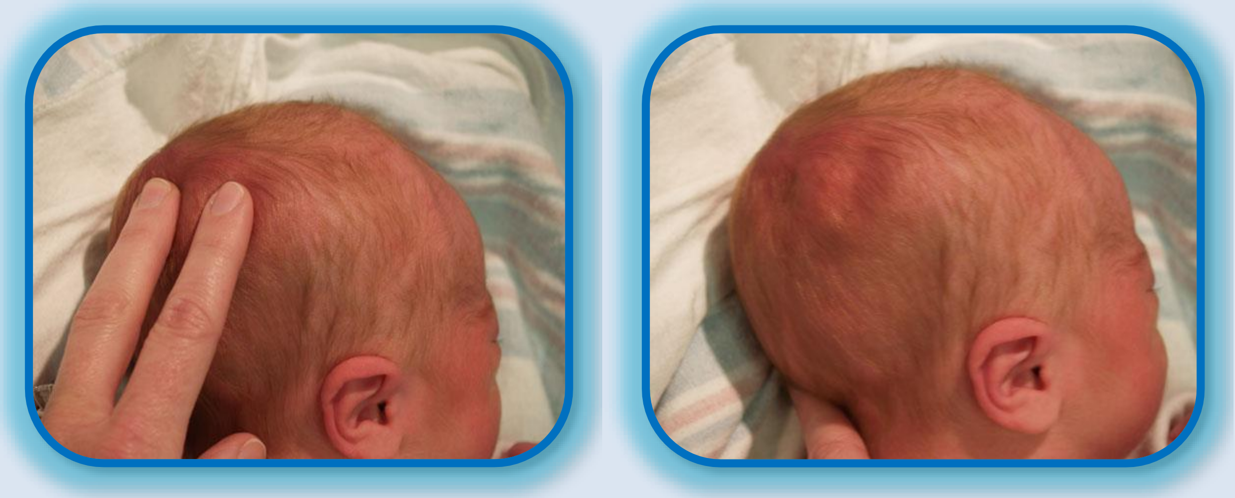
The following day, caput is much less prominent. This is consistent with the natural course of caput (**maximal at birth, with rapid resolution** over the next 24 - 48 hours).

Caput Succedaneum



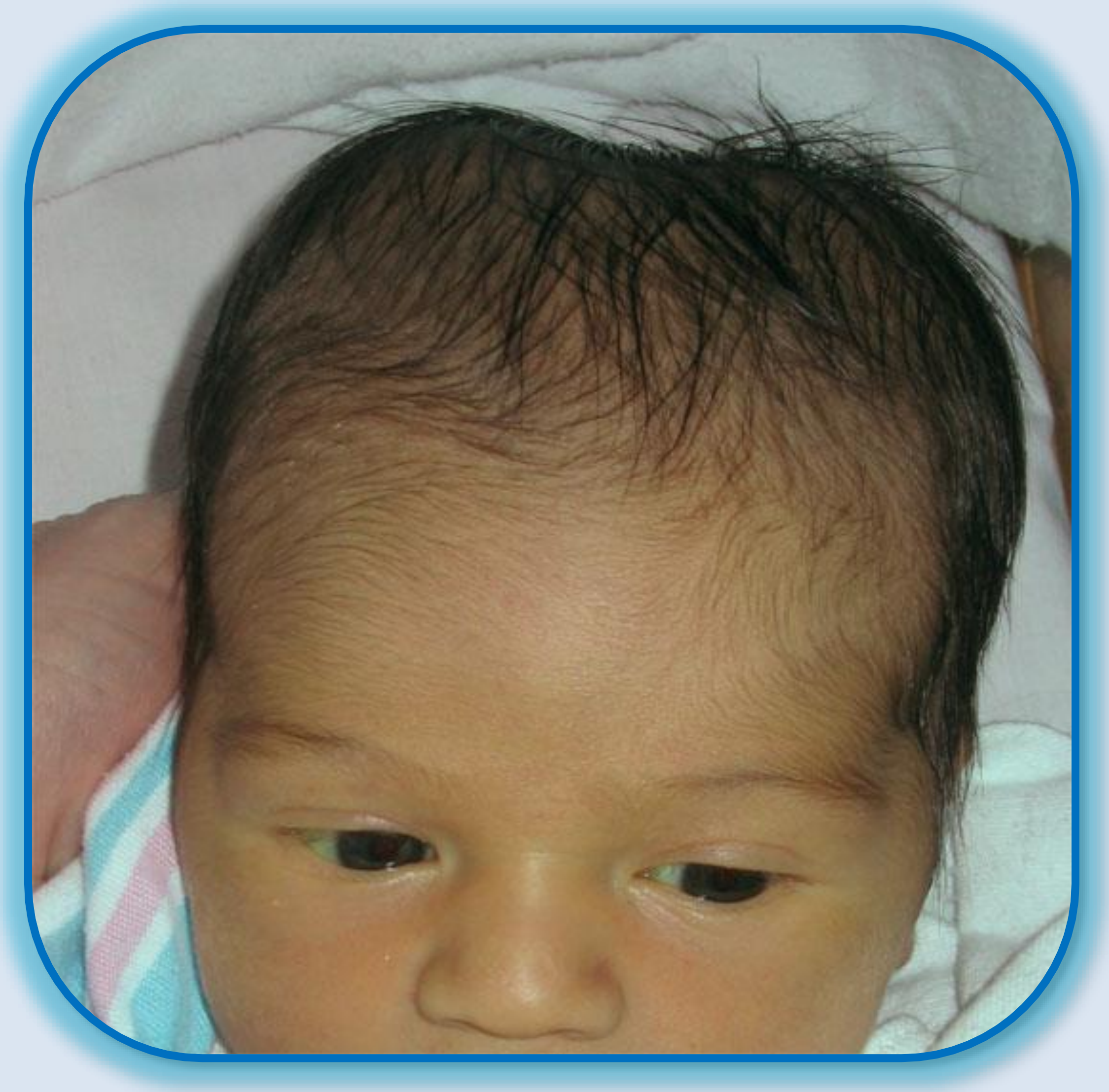
A second infant, few hours after birth. Caput is not easily visualized in this photograph, but can be appreciated on exam.

Caput Succedaneum



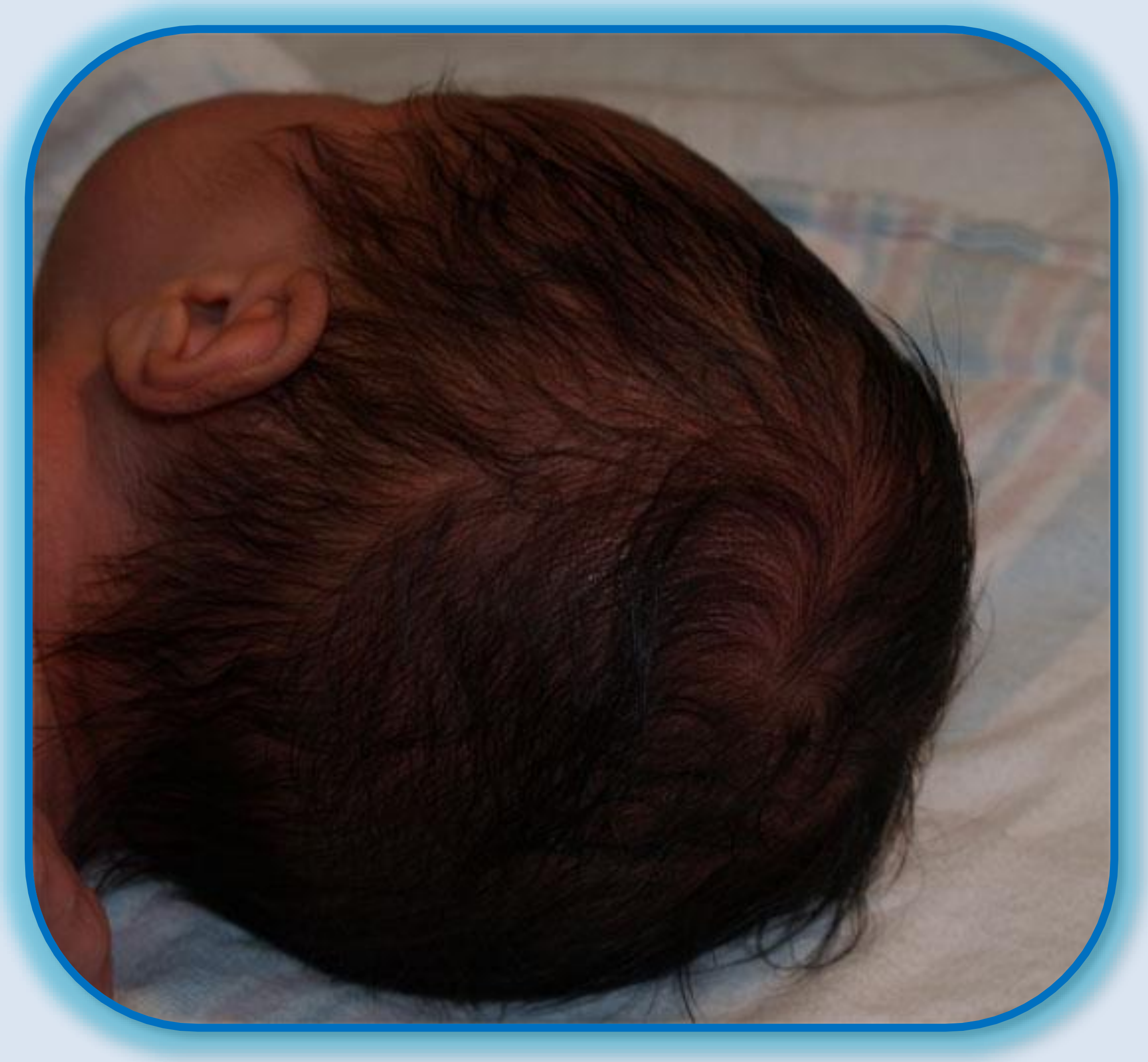
With firm pressure, the extent of the caput is starting to be appreciated. When pressure is removed, the two indentations are visible. By the next morning, the edema had completely resolved.

Cephalhematoma



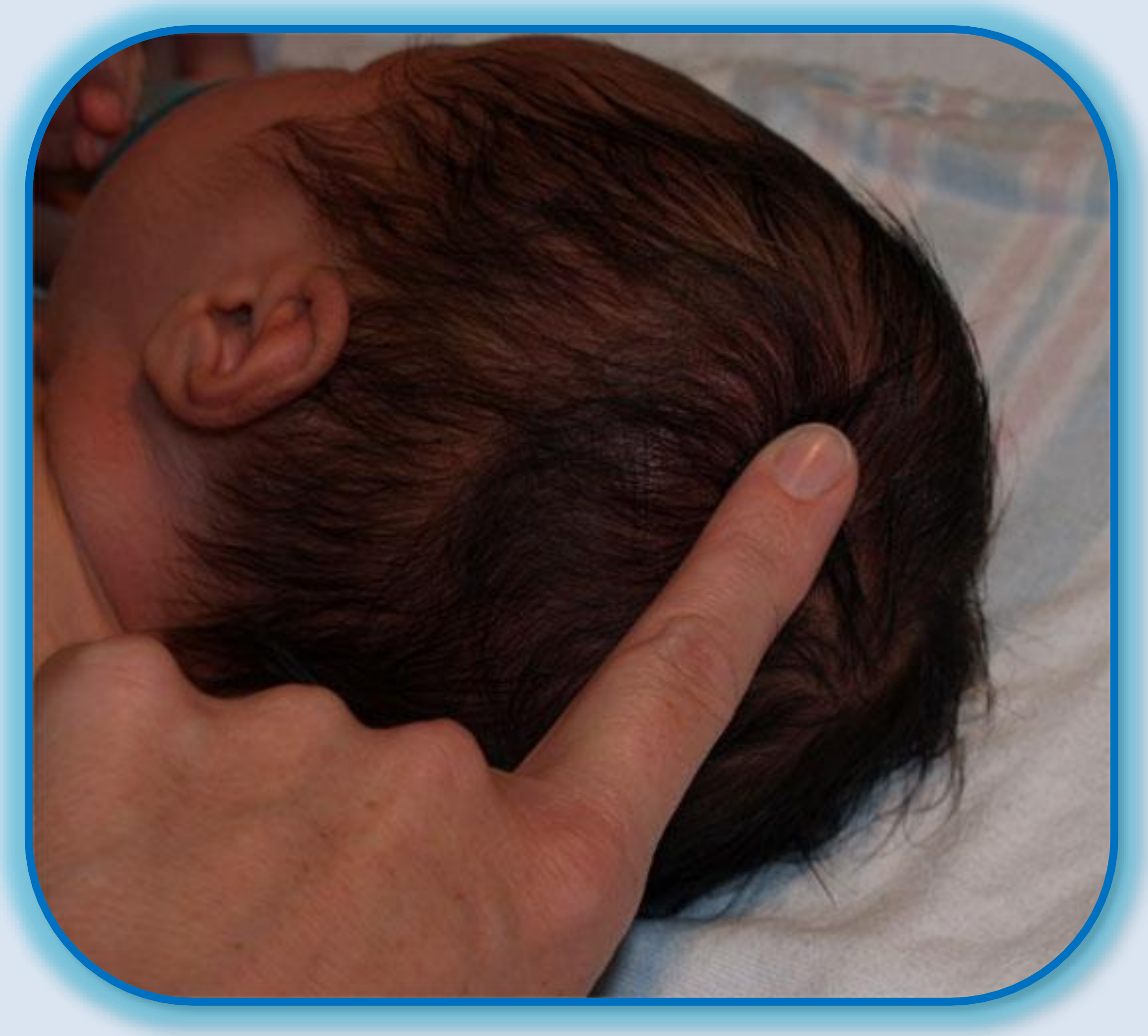
Cephalhematoma is a **collection of blood under the periosteum** of a skull bone. Because of its location, **it is impossible for cephalohematoma to cross suture lines**. If more than one bone is affected, there will be a separation between the two areas at the suture line as seen in this photo (the sagittal suture separates the bilateral parietal cephalhematomas). On palpation, these areas feel **fluctuant**. A ting of **jaundice** can be seen in eyes.

Cephalohematoma



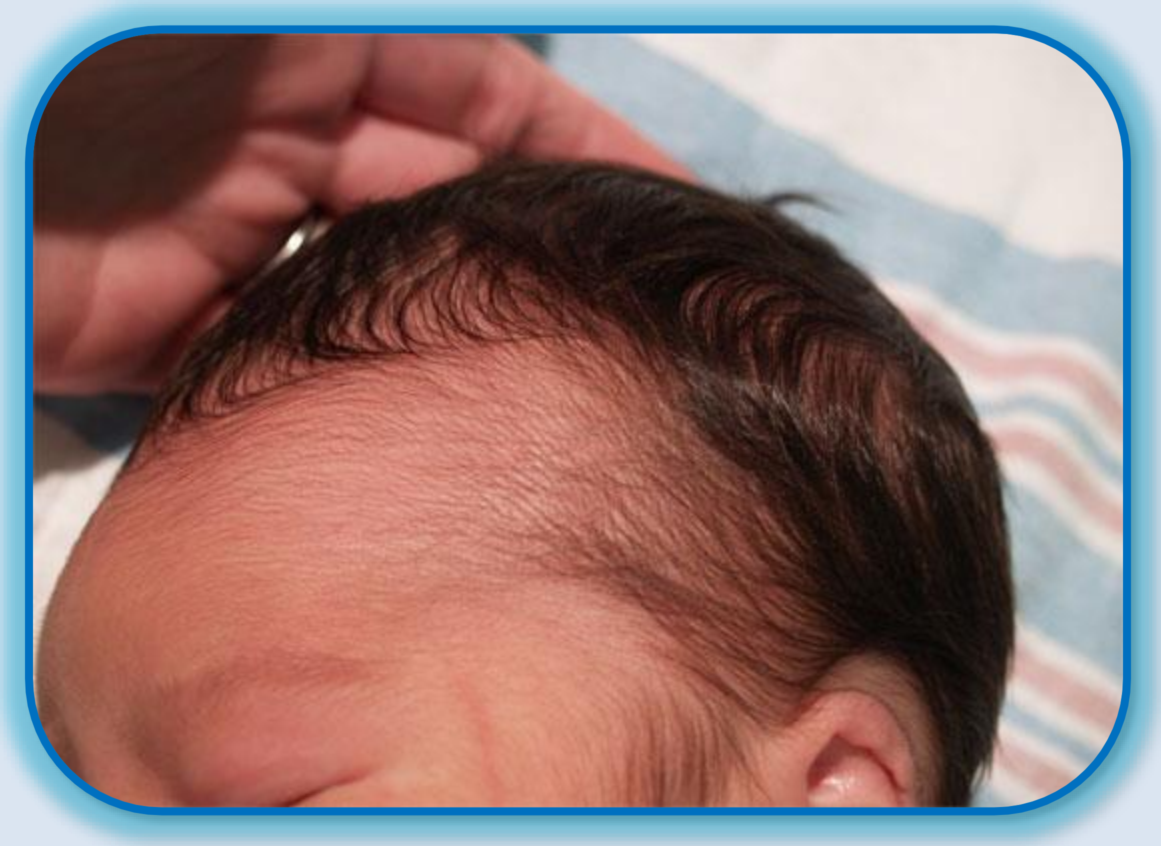
In this infant the fluctuance on physical exam is striking, even though the visual appearance is not significantly deviated from normal.

Cephalohematoma



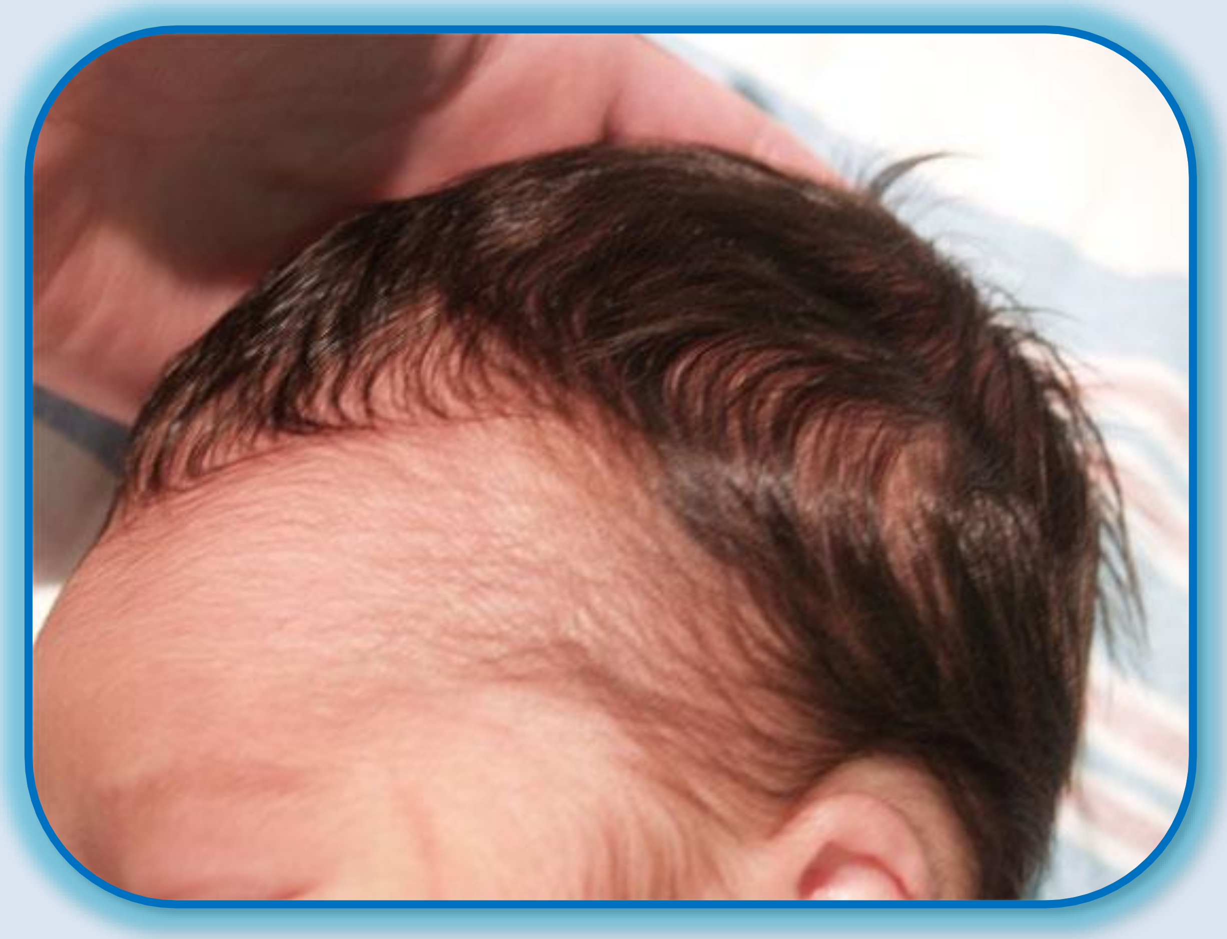
When digital pressure is applied, the fullness shifts from under the finger to the surrounding areas. When pressure is released, blood immediately refills this area and the appearance **(unlike caput)** is identical to the way it was before. In this baby, blood was ballotable across most of the left parietal bone. As with all cephalohematomas, it was **limited by the suture lines**.

Subgaleal Bleed



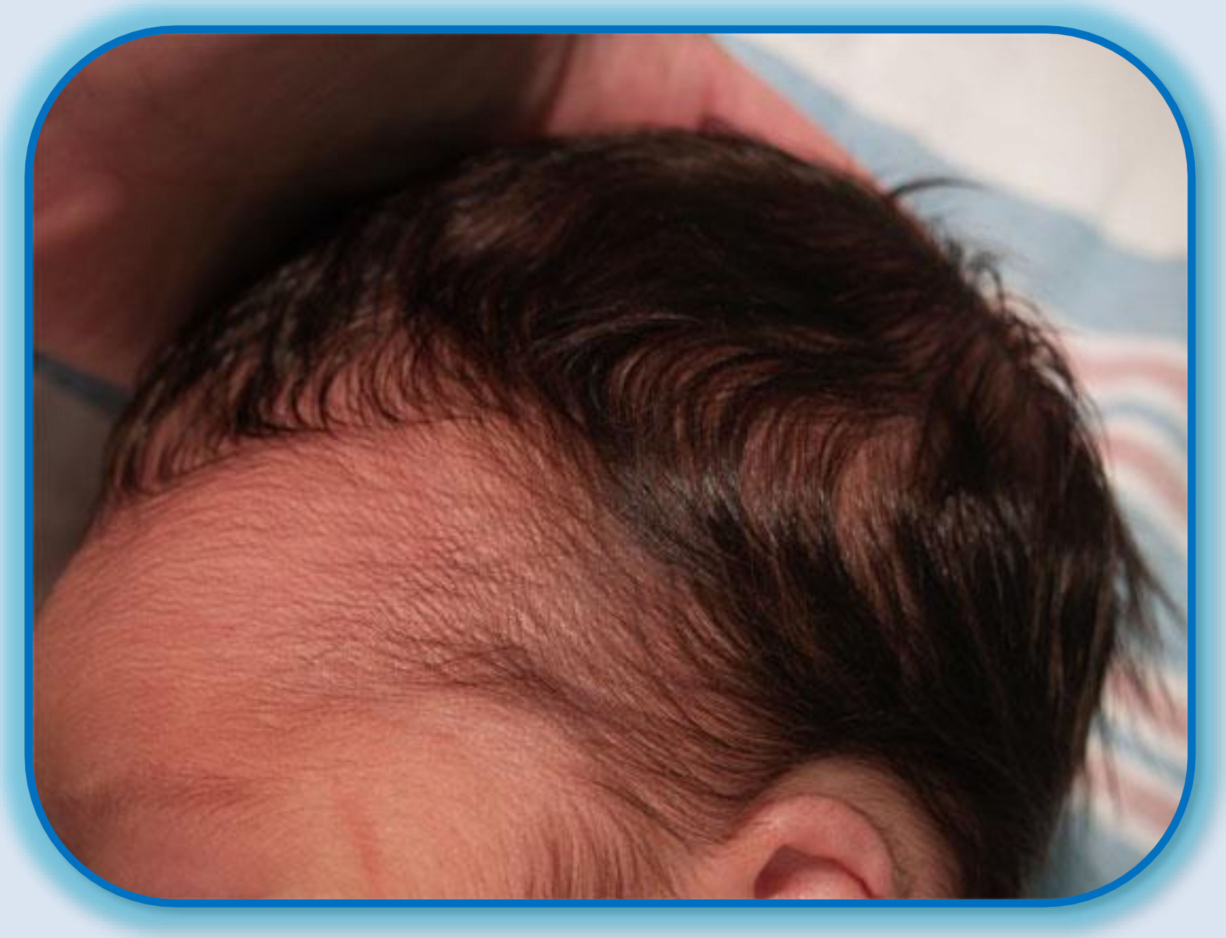
The subgaleal area is a large potential space, so when bleeding occurs there, it **easily moves to the dependent part of the head**. Because of the size of the space, exsanguinations of the baby's entire circulating blood volume into the subglaeal space is a possibility if active bleeding continues.

Subgaleal Bleed



The same baby's in the previous photo, but here pressure is being applied with the palm and fingers to squeeze the blood that was in a dependent location into a more visible, anterior location. The sensation is similar to that of handling a water balloon. It is a very **fluctuant, shifting** mass without discernible limitations.

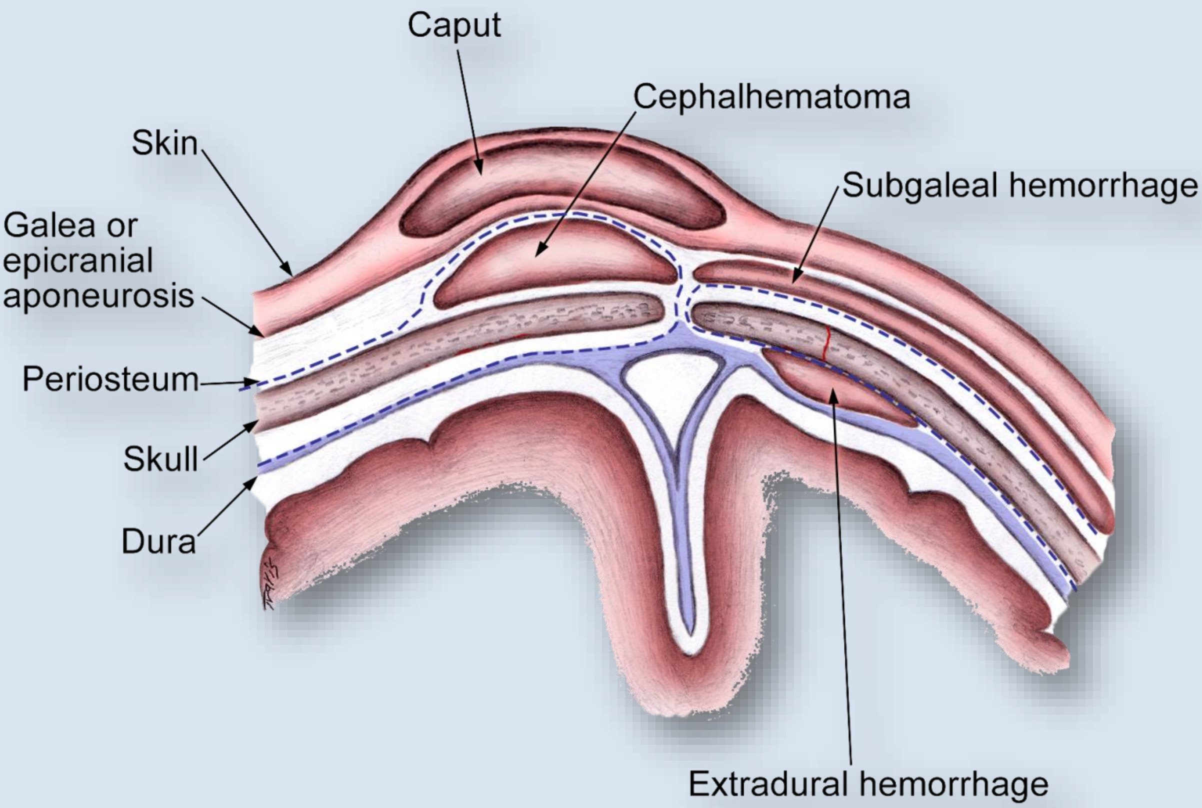
Subgaleal Bleed



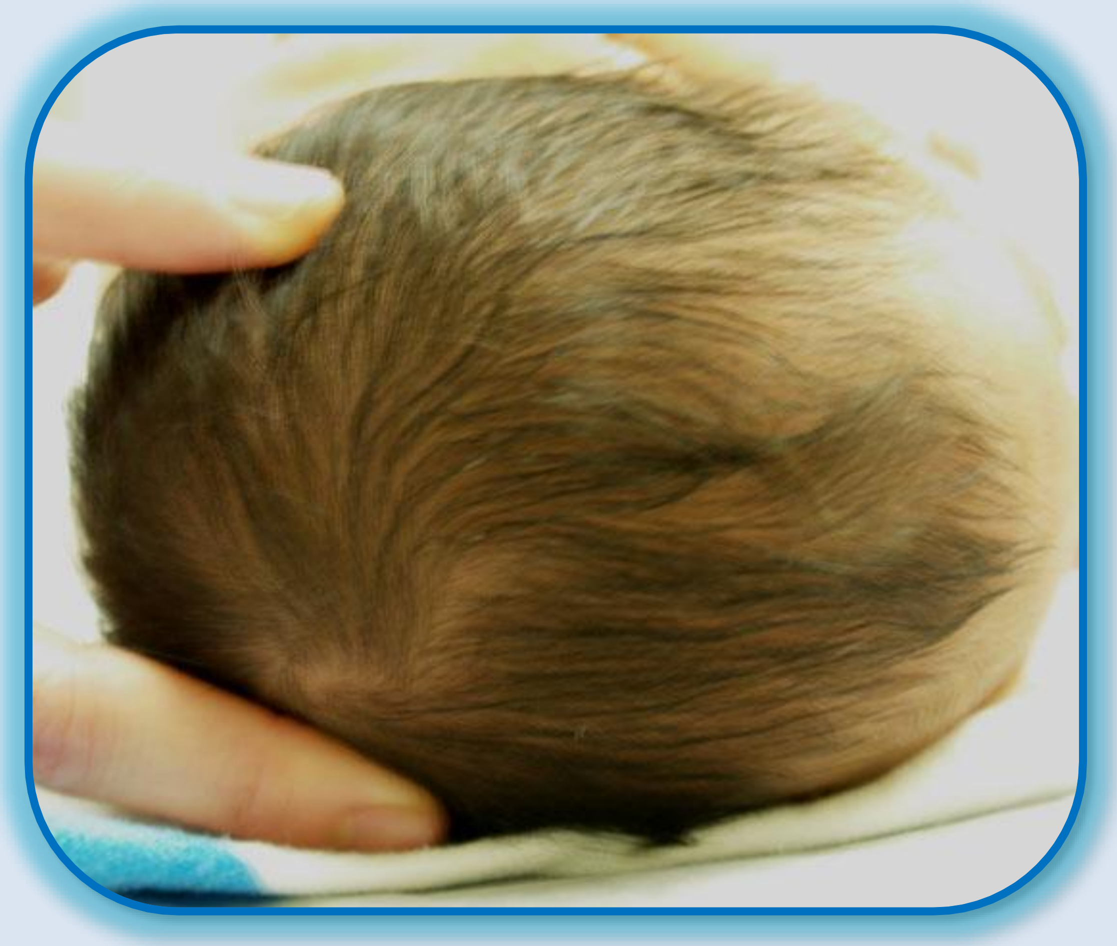
The same baby, as the fluid is pushed anteriorly, an even larger bulge can be seen over the baby's left parietal area and anterior fontanel.

This infant did very well. Serial hematocrits and frequent vitals were stable and a NICU consultation was requested. At the time of discharge, 4 days later, the fluctuant area was significantly smaller.

Difference between Caput Succedaneum and Cephalhematoma

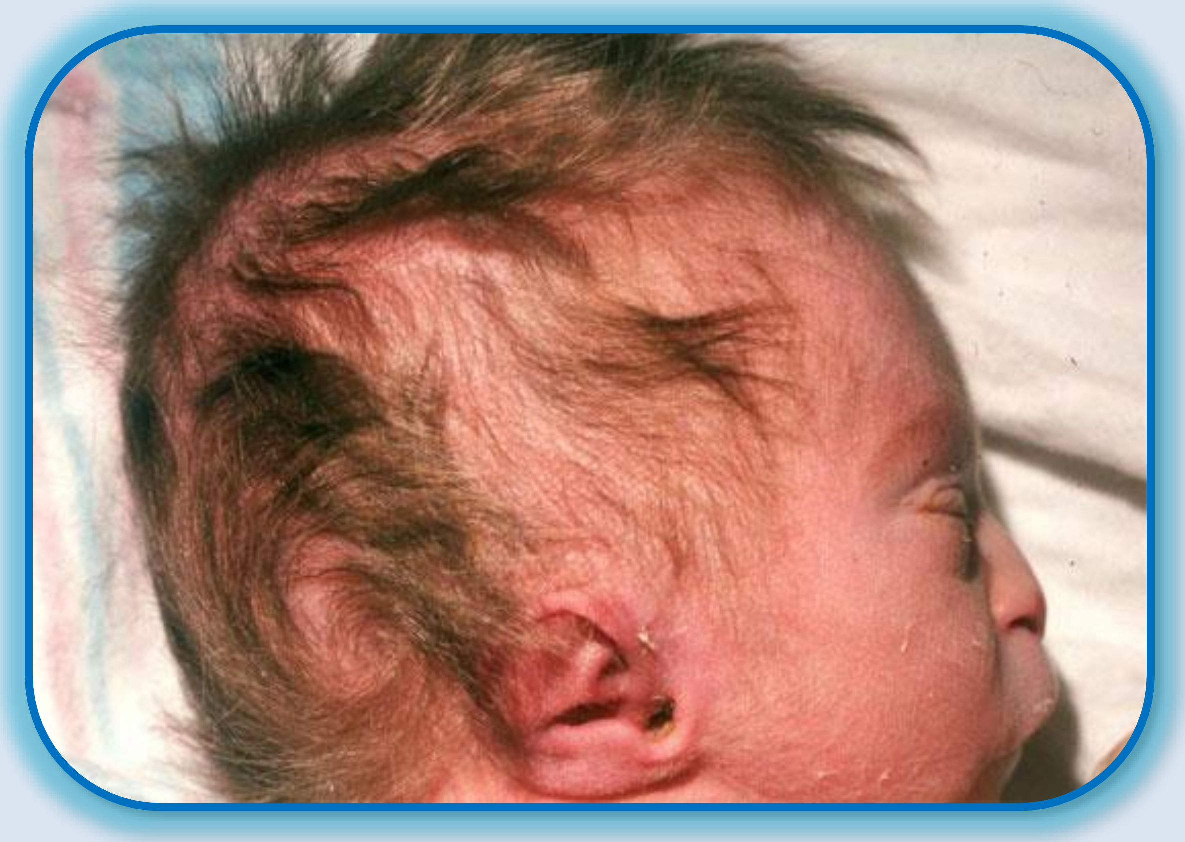


Lacunar Skull



This infant had **craniotabes** to such a degree that the area between the two fingers seemed as if it were a giant fontanel. On imaging, bone was present in this area, and a diagnosis of lacunar skull (craniolacunia) was given. Although **frequently associated with Arnold-Chiari malformation or myelomeningocele**, this child was otherwise well and had a normal brain MRI. One radiographic finding associated with lacunar skull is a scalloped appearance of the skull bones.

Unusual Hair Whorls

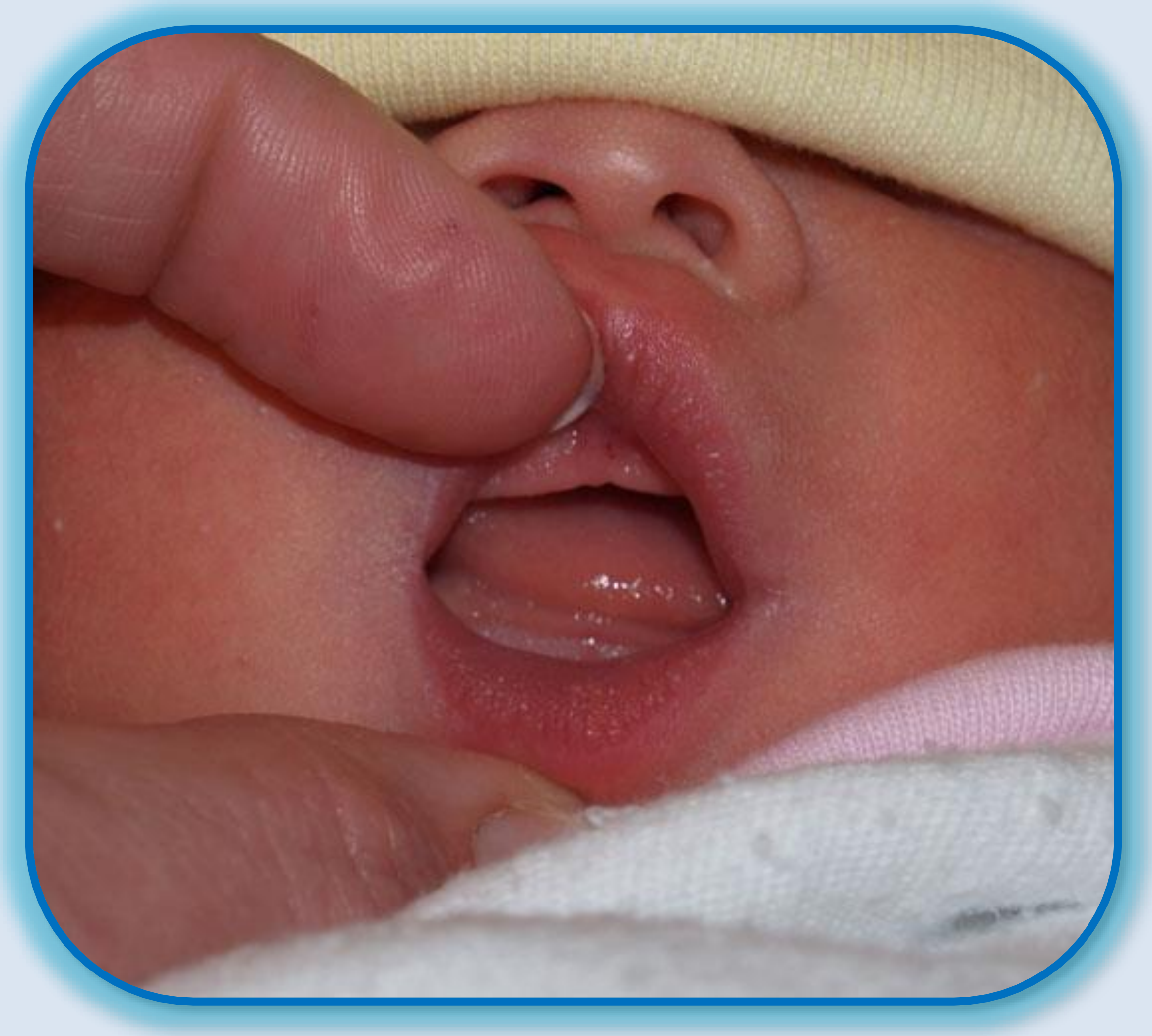


Normally, because the growth of the brain occurs in a predictable fashion, there is one primary hair whorl over the vertex of the head. **When hair whorls are multiple or in unusual locations, abnormal brain growth may be a causative factor.**

In this infant, a hair whorl can be seen behind the right ear, and the rest of the hair appears unruly, with a variety of directions of growth. **Trisomy 13 was the underlying diagnosis**.

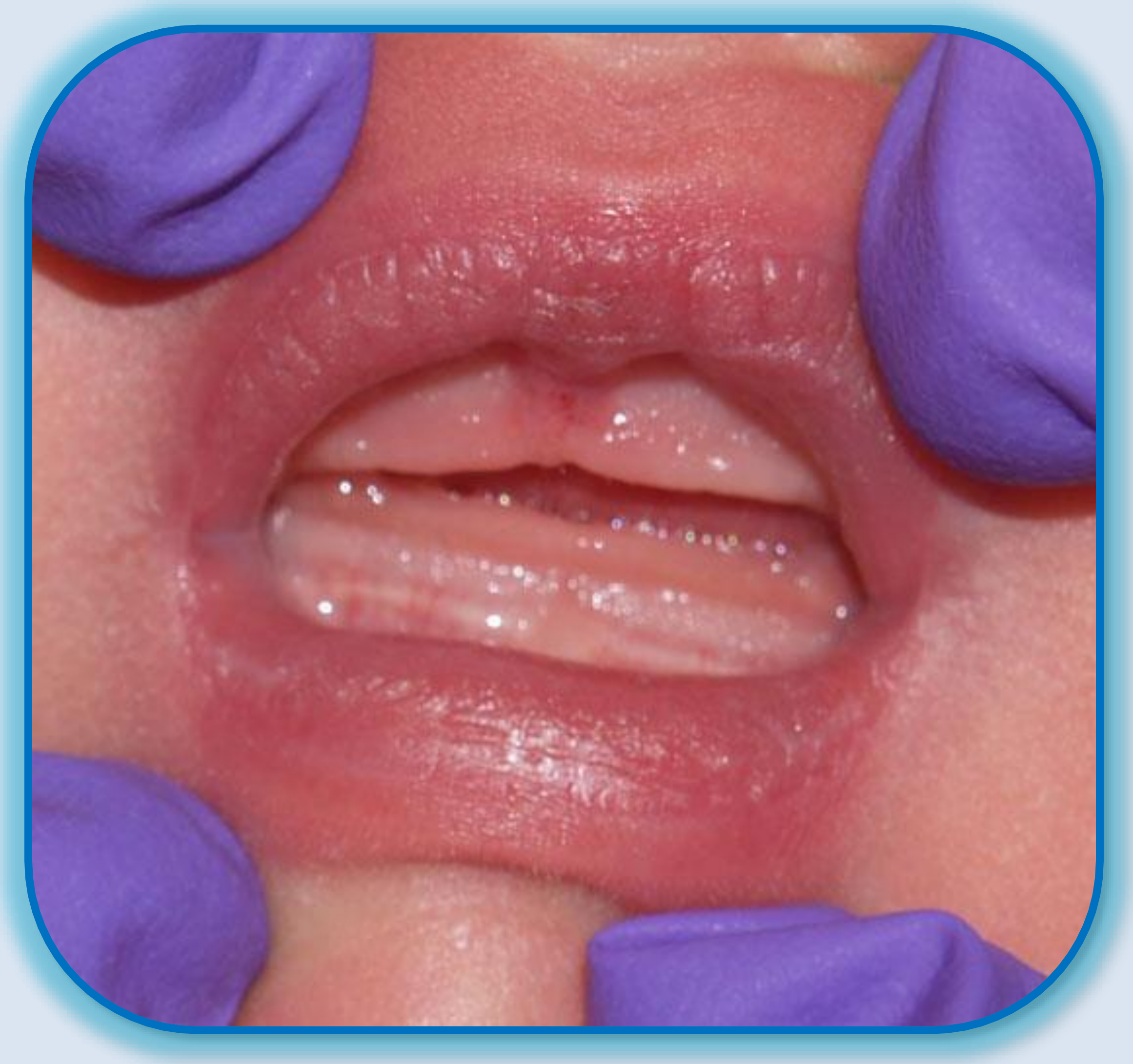
Mouth

Positional Deformity of the Jaw



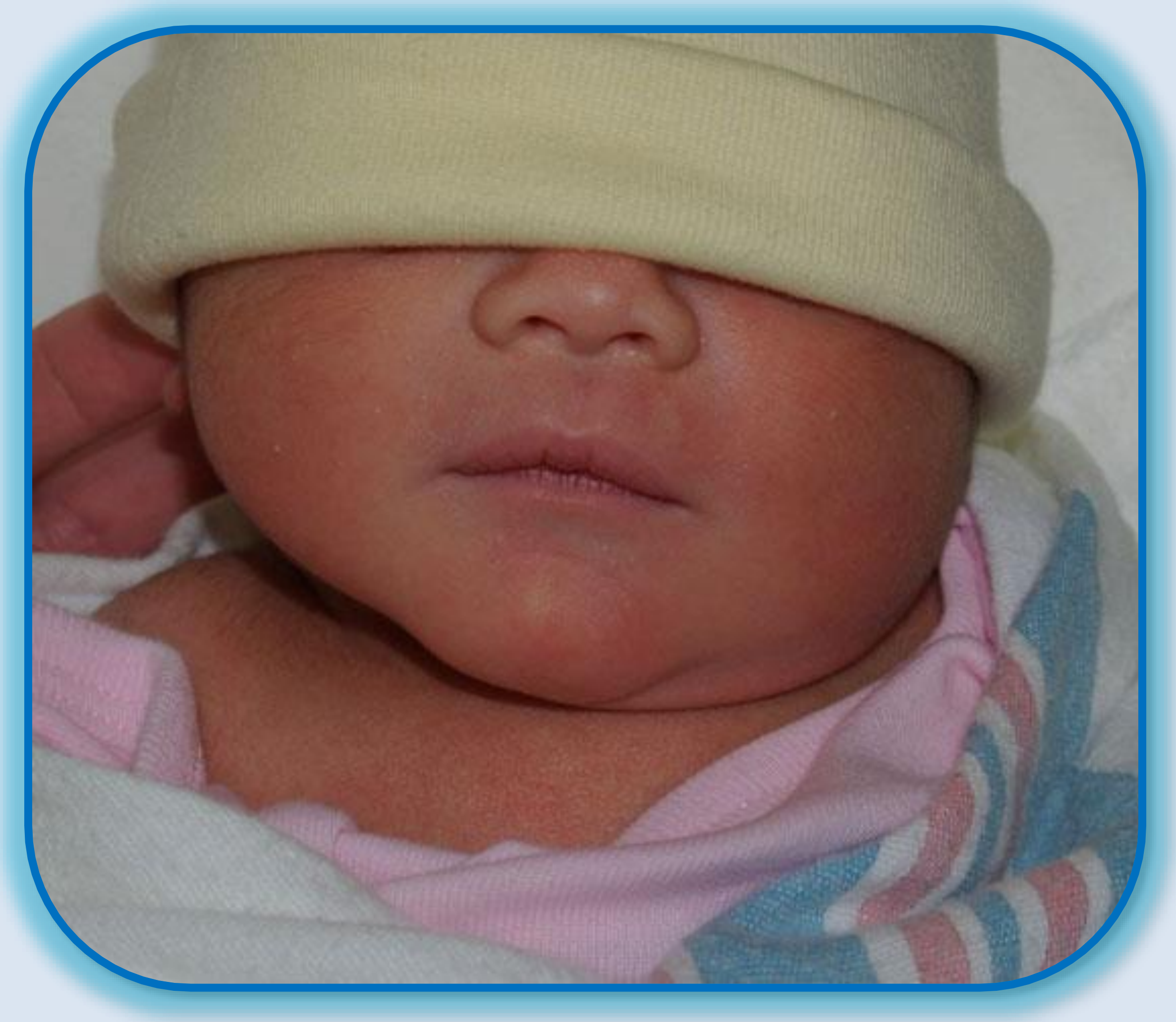
In this newborn, the gums are not parallel with each other. This is due to **in utero molding**, when the head has been turned to one side and the chin has been pushed up against the shoulder for some time. The angle is usually mild, but in some cases, it can be pronounced enough that the jaw sublaxes with opening. **Spontaneous resolution** is expected.

Positional Deformity of the Jaw



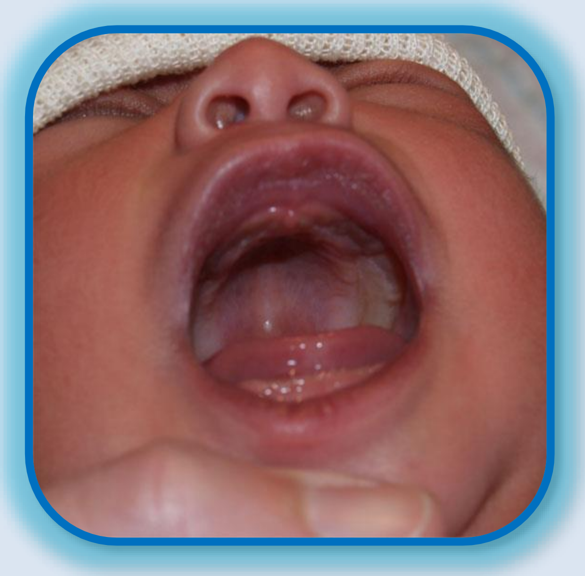
A closer view of the same infant, the angle between the upper and lower jaws can be better appreciated with the gums closer together.

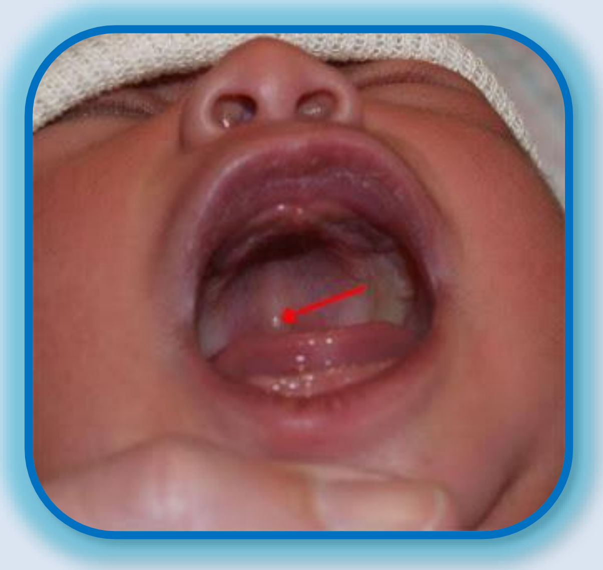
Positional Deformity of the Jaw



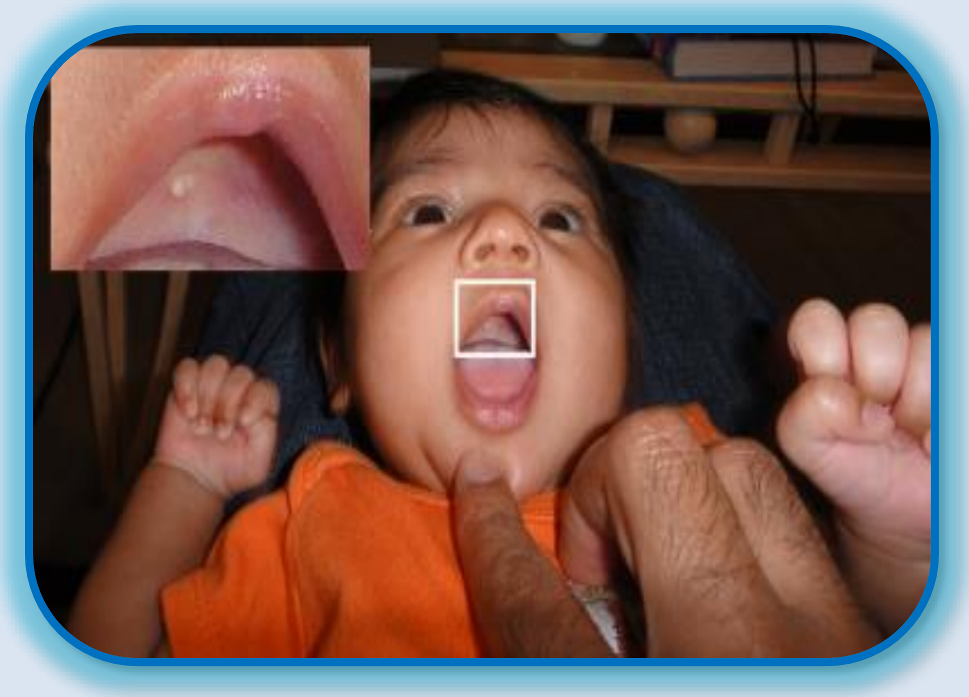
With a wider view, the **asymmetry of the chin** can be seen. The right side of the chin is more concave and fits nicely up against the right shoulder (the position in utero). In contrast, the left side of the chin appears more full.

Epstein Pearl



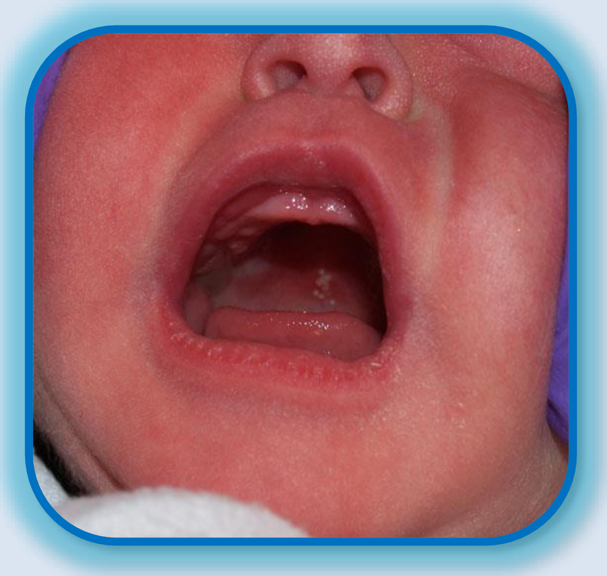


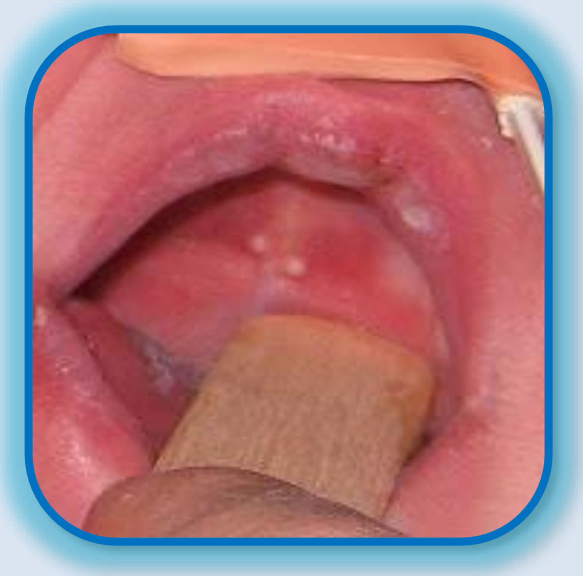
The small white papule seen in the midline of the palate of this infant is an Epstein pearl. It represents **epithelial tissue** that becomes **trapped during the palatal fusion**. It is a **very common** and **benign** finding.



Epstein Pearl in 5 week old infant

Epstein Pearl



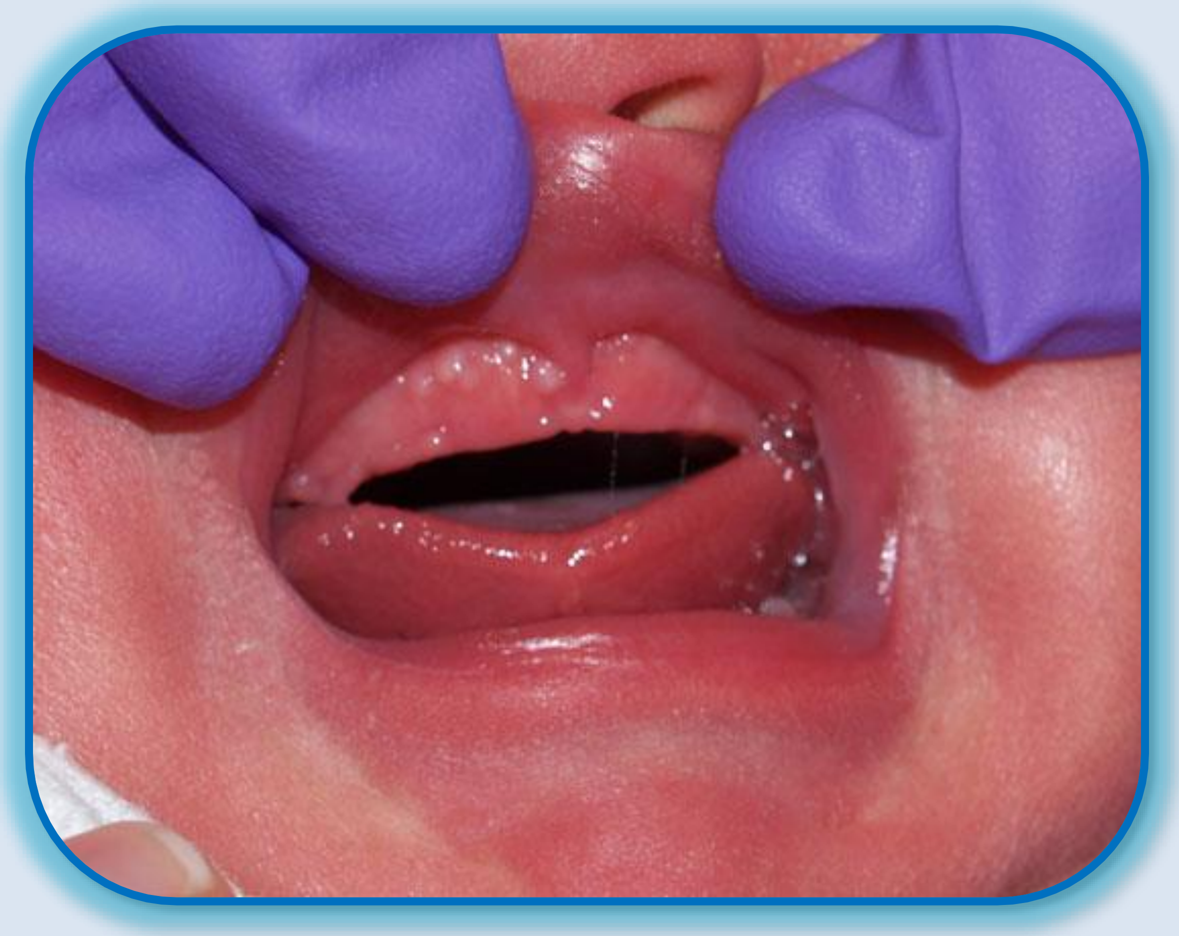


On palpation, these are **firm papules** that can be appreciated when the infant is sucking on the examiner's finger.

They do not require treatment as they **resolve spontaneously** over the first few weeks of life.

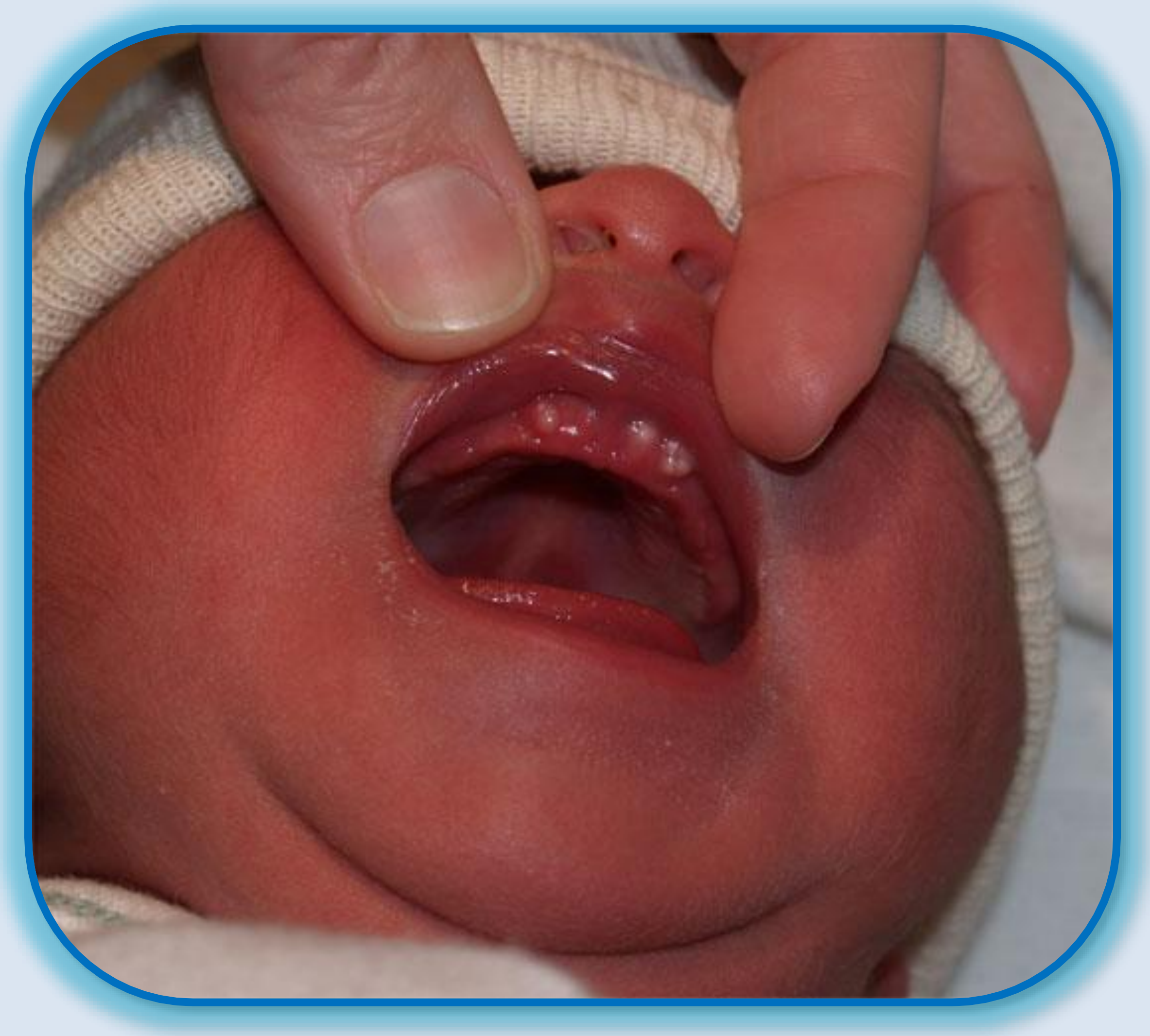
Epstein's pearls are **very common and benign** small white or yellow cystic vesicles (1 to 3 mm in size) often seen in the median palatal raphe of the mouth of newborn infants (**occur in 65-85% of newborns**).

Bohn's Nodules



The **white bumps** present on the upper gum in this infant are Bohn's nodules. The exact **etiology is unknown**, but they are thought to arise from remnants of the dental lamina or from heterotrophic salivary glands. Present either on the lateral aspect of the gum or on the periphery of the palate, these nodules are a **benign** finding and will disappear with time.

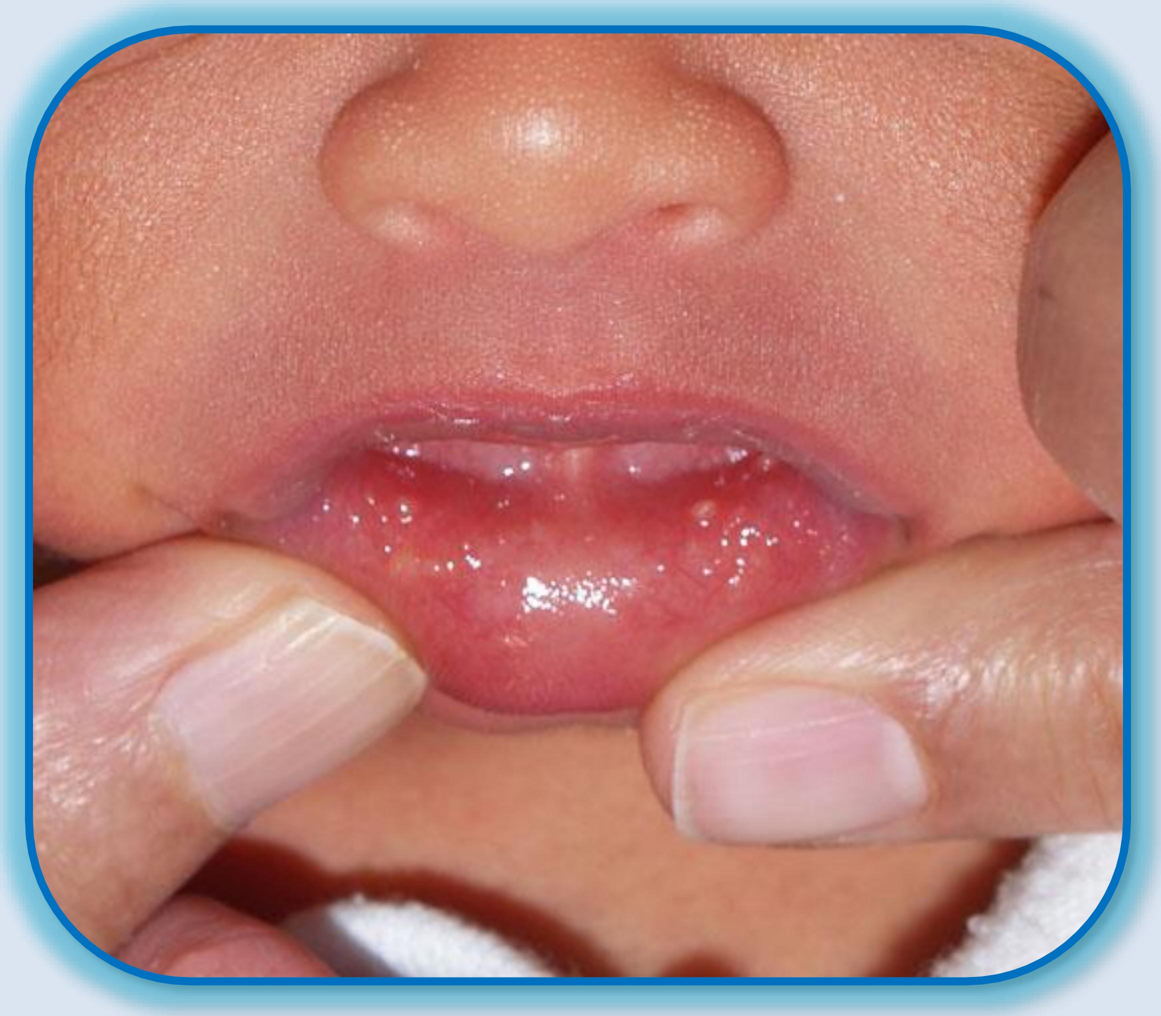
Bohn's Nodules



Here is another infant with the same finding. When the nodules are large, they are sometimes **mistaken for teeth**, but the position on the exterior surface of the upper gum is inconsistent with teeth.

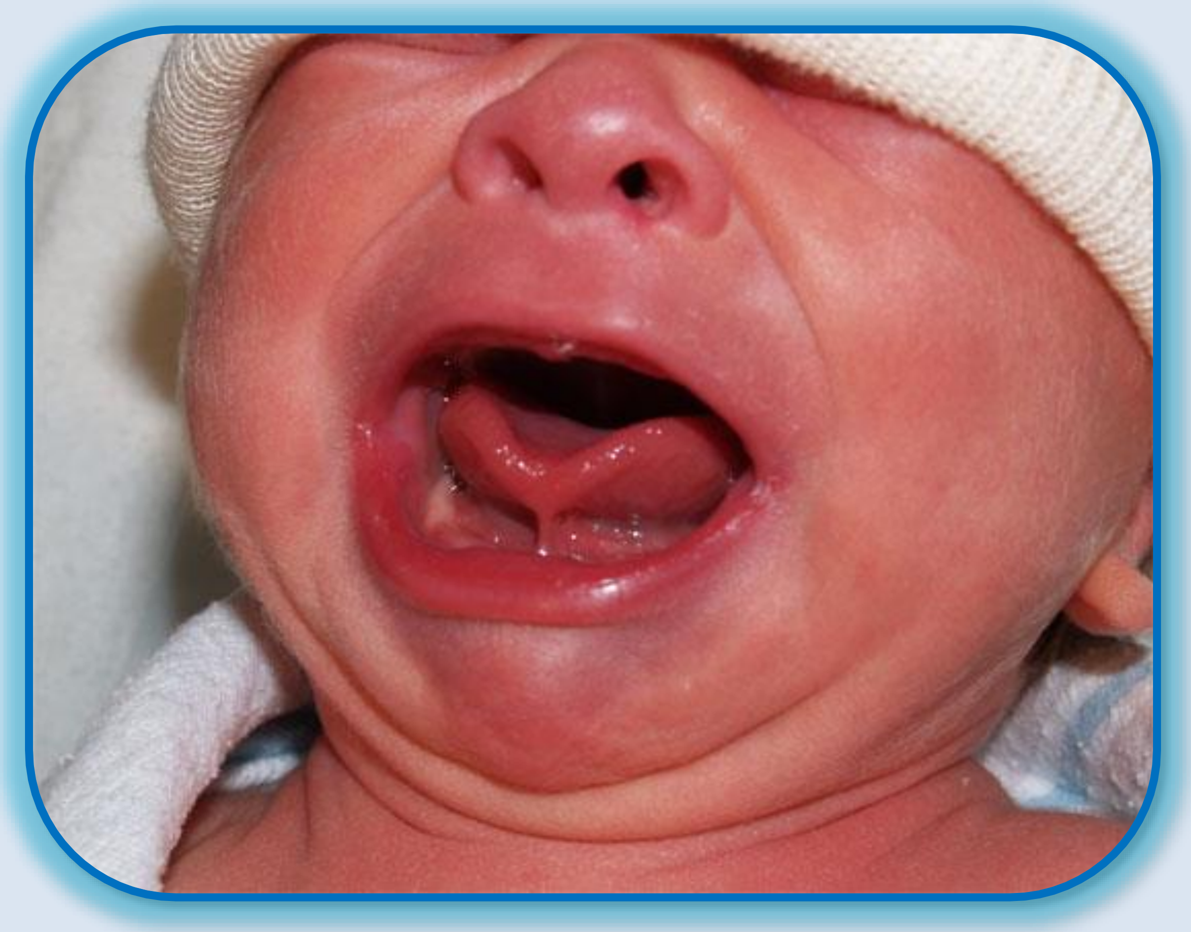
When natal teeth occur, they erupt from the alveolar ridge, and typically occur in the mandibular gum.

Salivary Glands



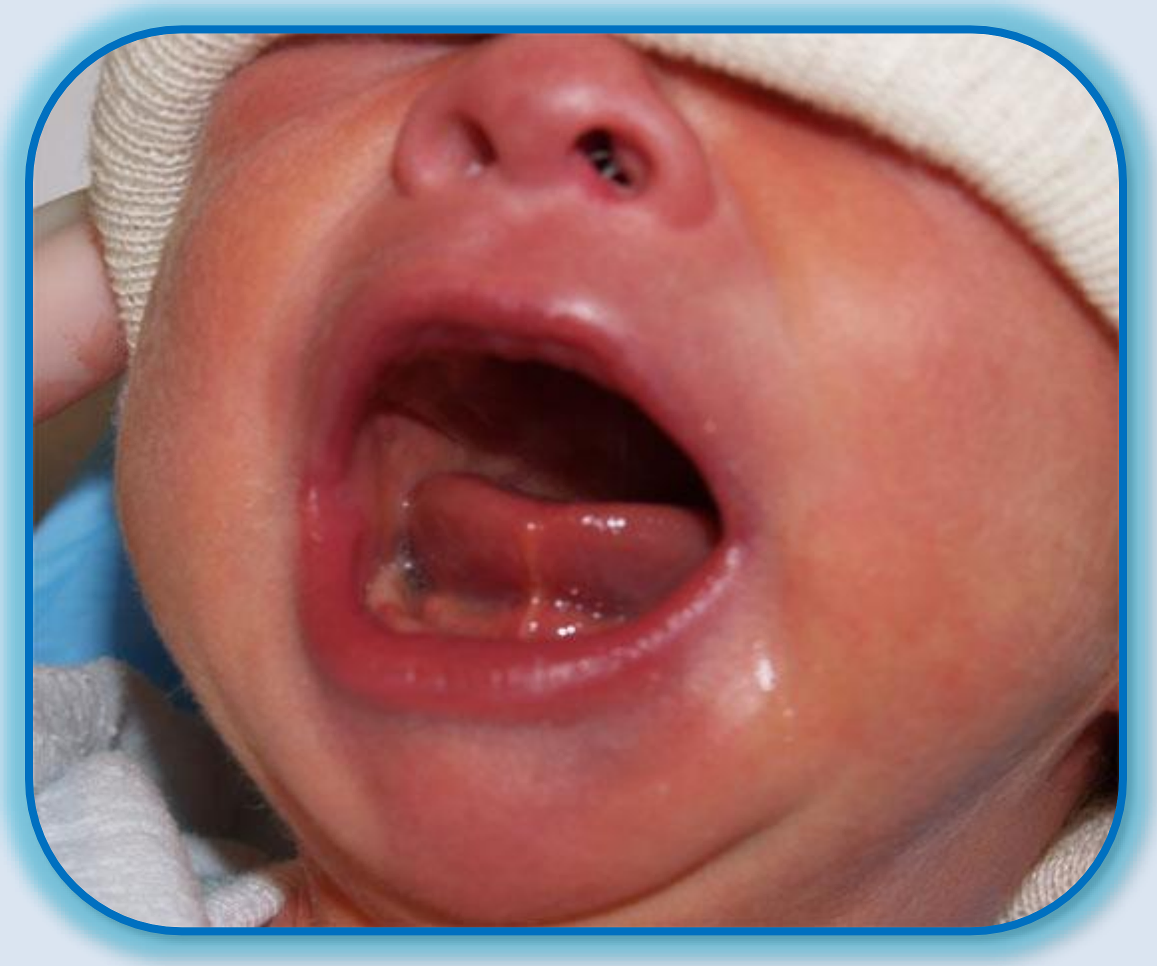
These vesicular-looking lesions were first noted by the mother as she was getting the baby latched on for feeding. These are minor salivary glands that are just more prominent than usual. **No evaluation is needed**.

Ankyloglossia



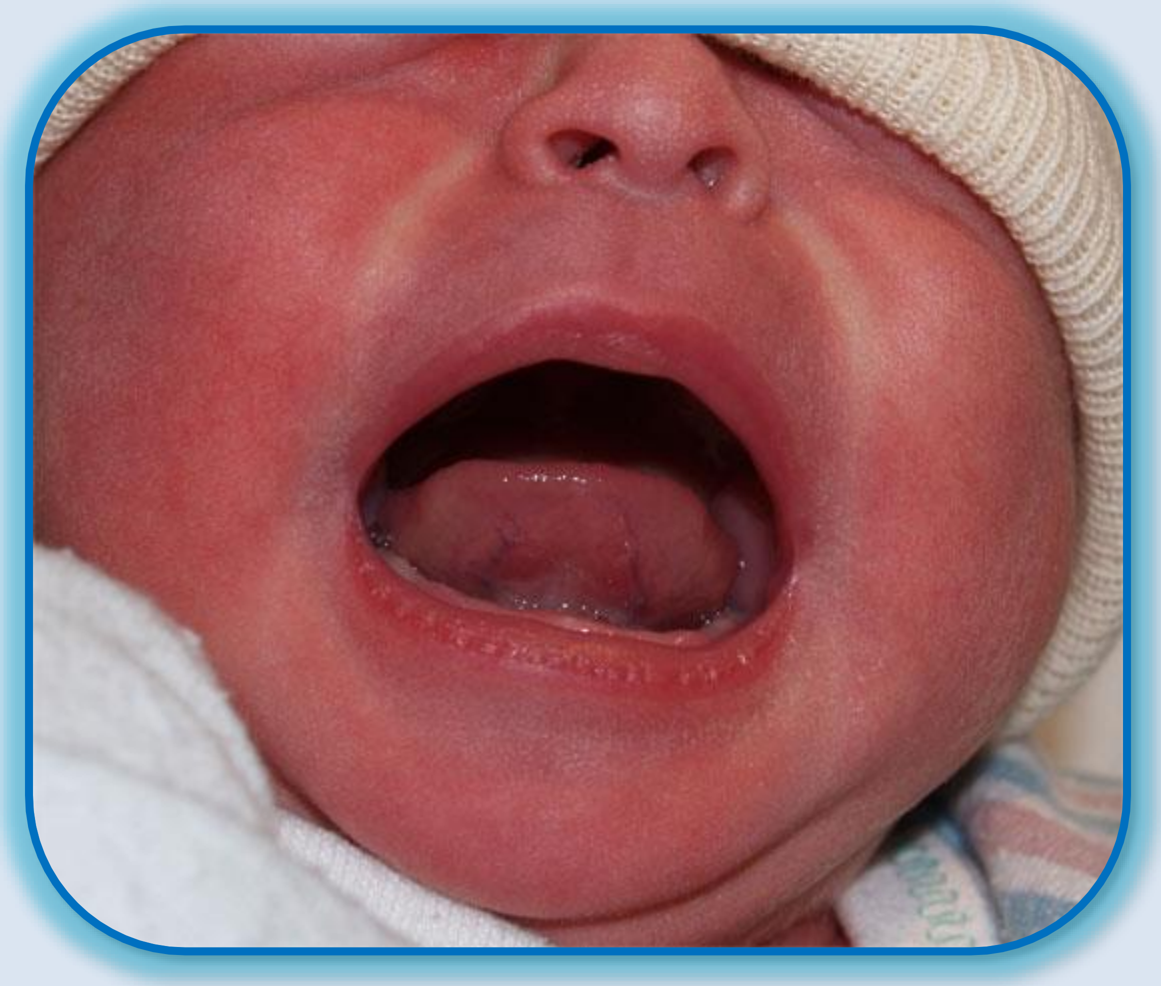
Tongue-tie occurs in approximately **4%** of newborns. Many babies with this condition can breastfeed without difficulty, but in some cases, a tight frenulum makes latching on difficult. In those cases, **frenotomy** may be indicated.

Ankyloglossia



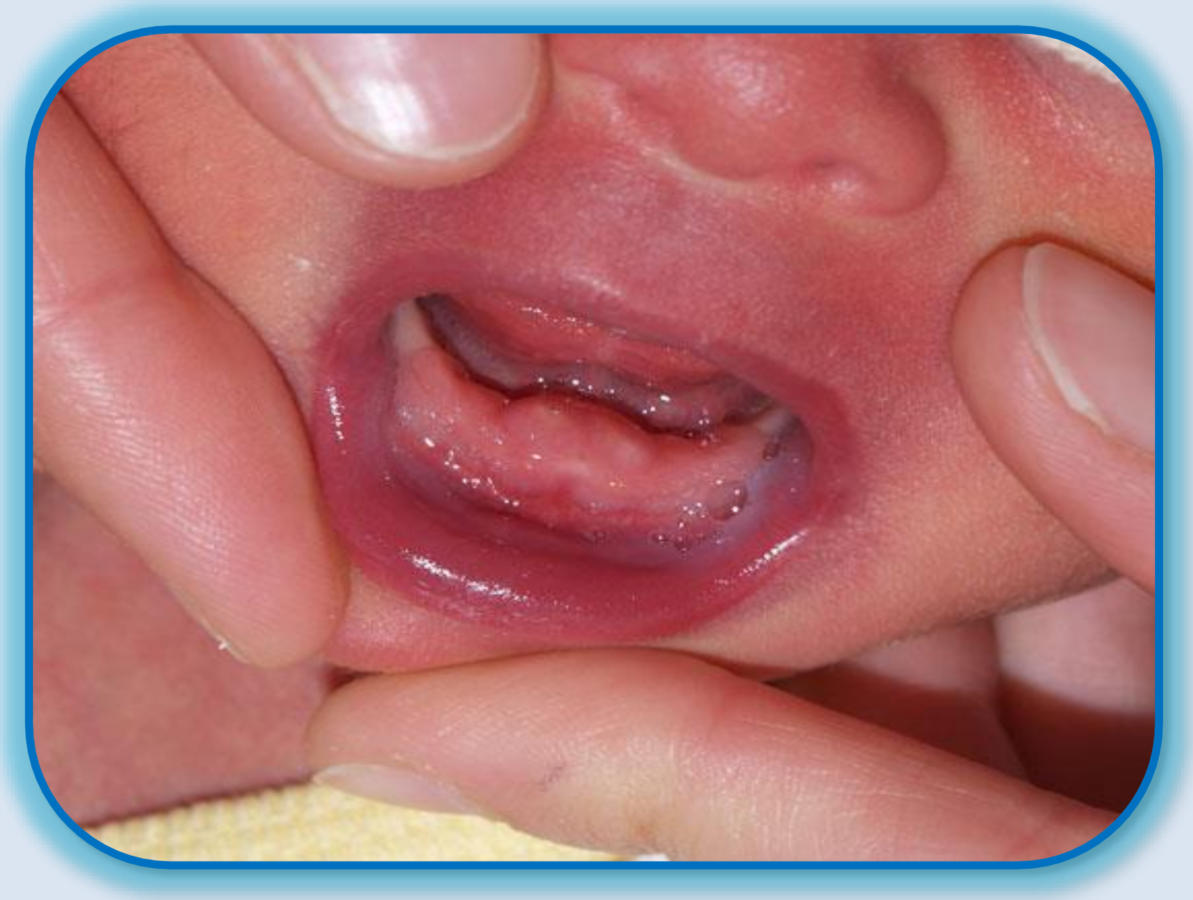
This is the same infant as in the previous photo, immediately after frenotomy. There is no bleeding, and the tongue is more mobile. Latching was significantly improved.

Normal Tongue



In contrast, this baby has no appreciable lingual frenulum, and has good mobility of the tongue with crying.

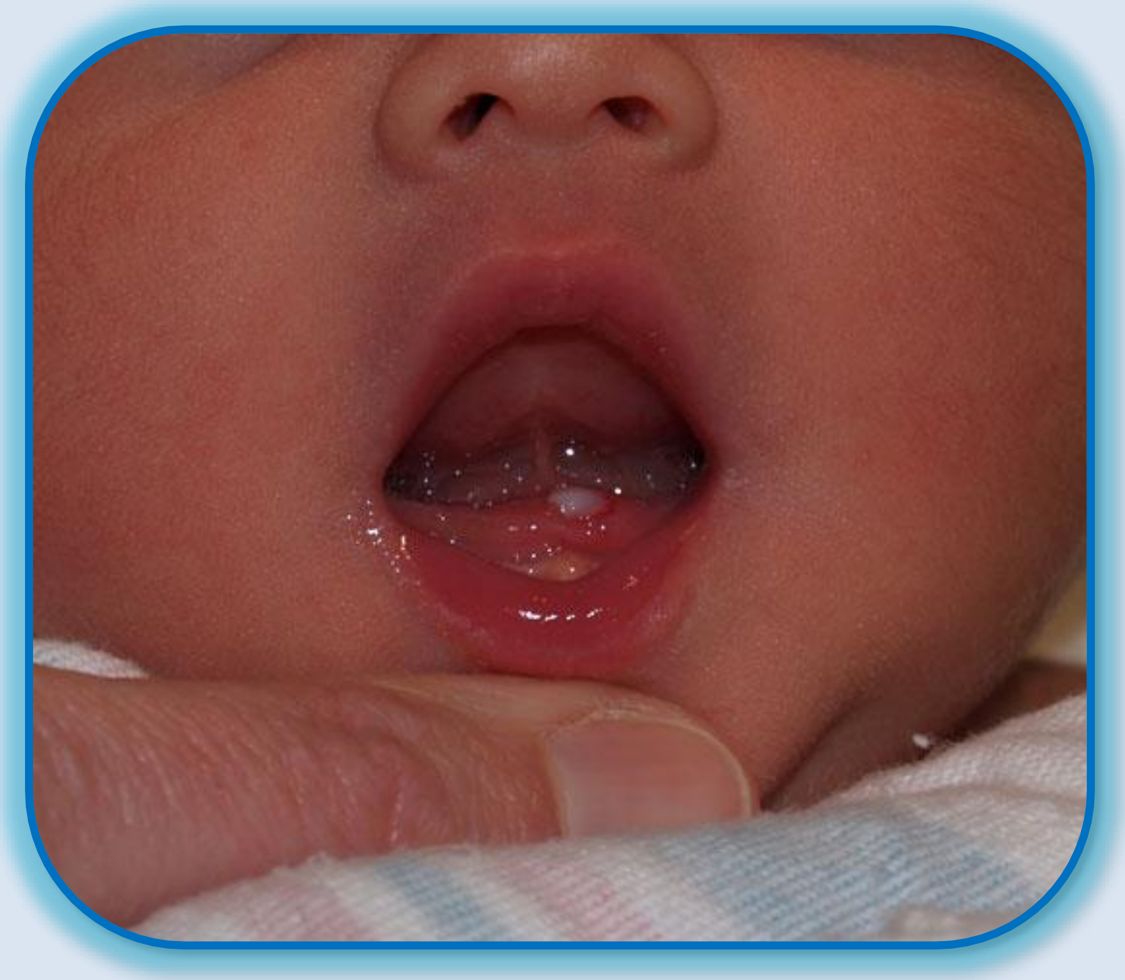
Natal Teeth



Natal teeth usually occur in this location in the **mandibular gum**. In this case, **eruption cysts** are still completely covering the teeth, but with **palpation**, 2 firm teeth can be appreciated.

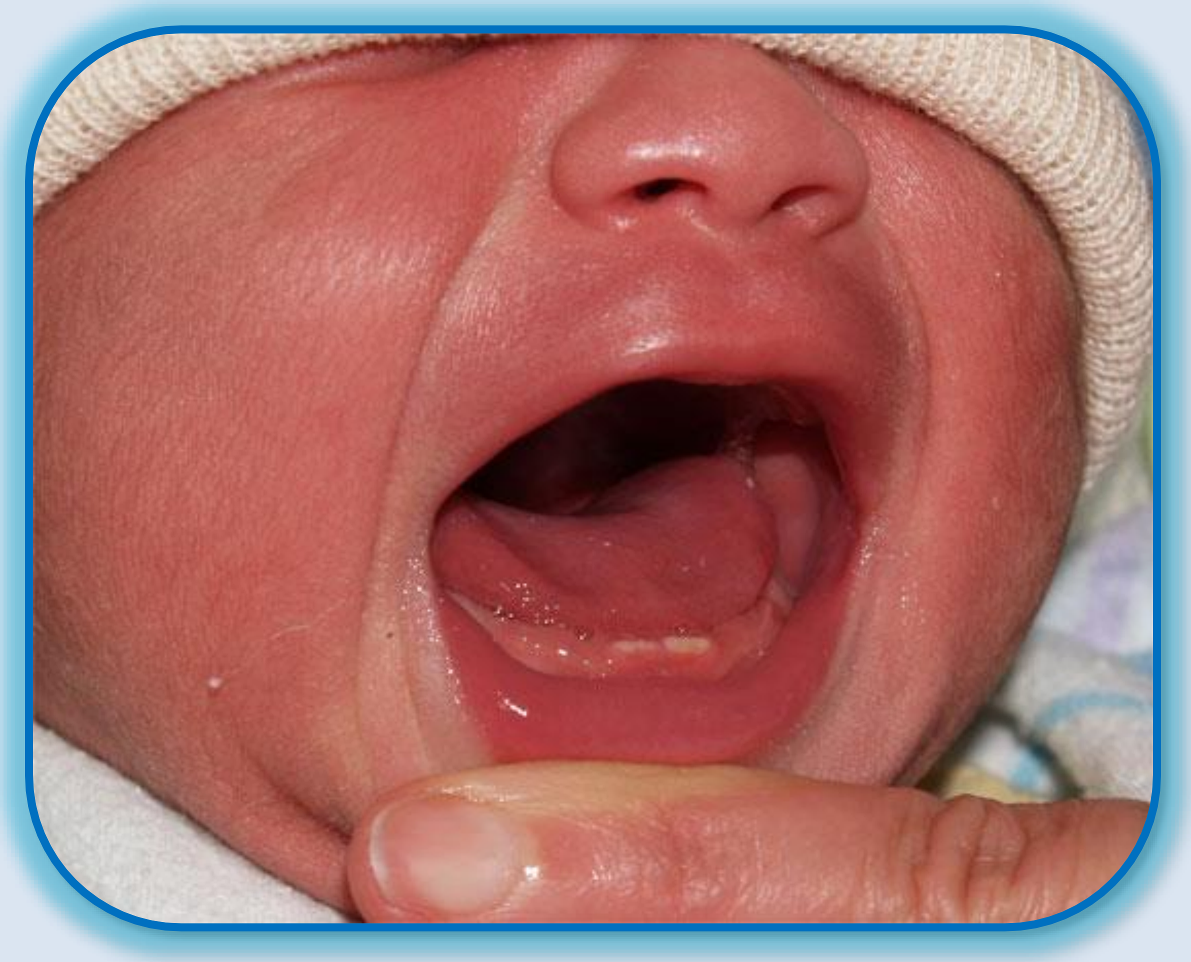
Natal teeth occur in **1:2000 - 1:3500** newborns. They are usually part of the primary dentition of the child, so they **should not be removed unless they are loose**, presenting an aspiration risk, or causing secondary tongue ulceration as in Riga-Fede disease.

Natal Tooth



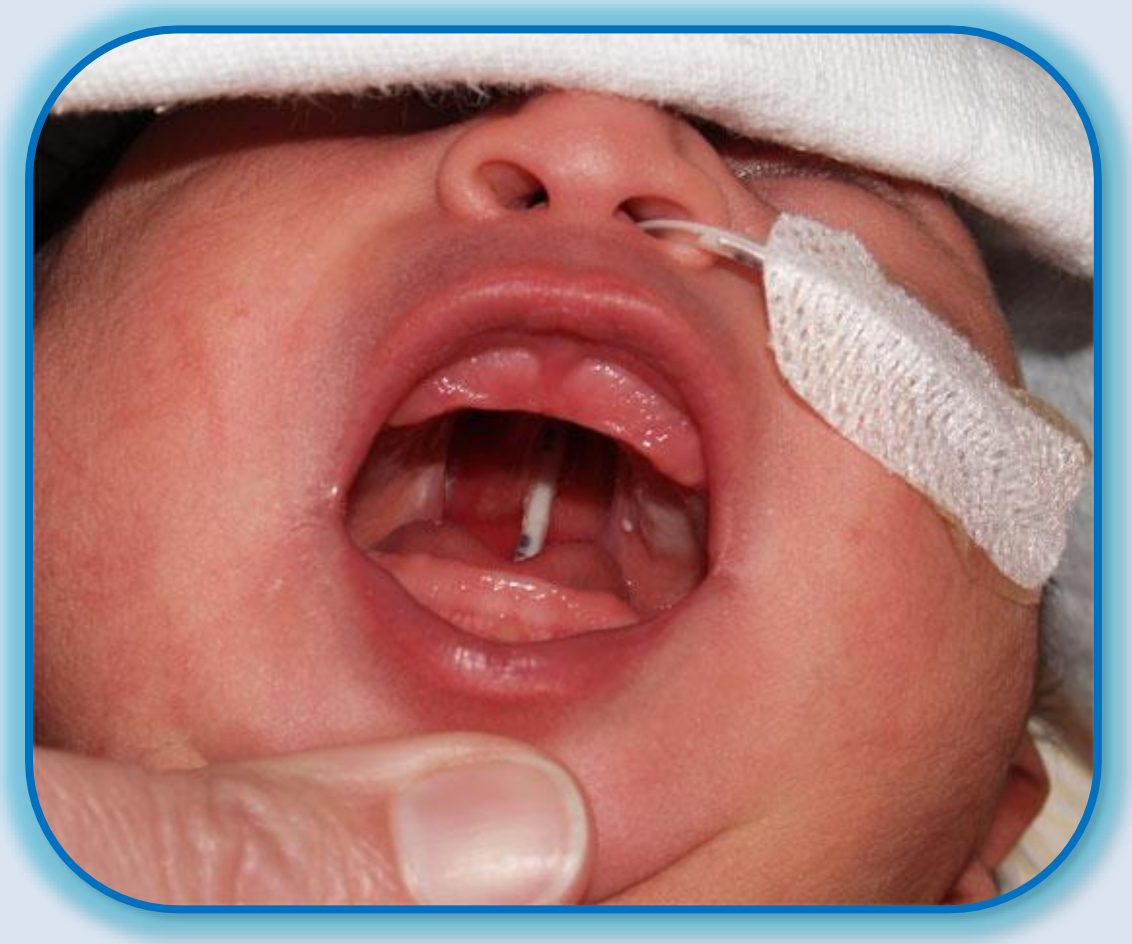
This infant's tooth is erupted and is clearly visible. When the tooth is mobile, it can easily be removed.

Natal Teeth



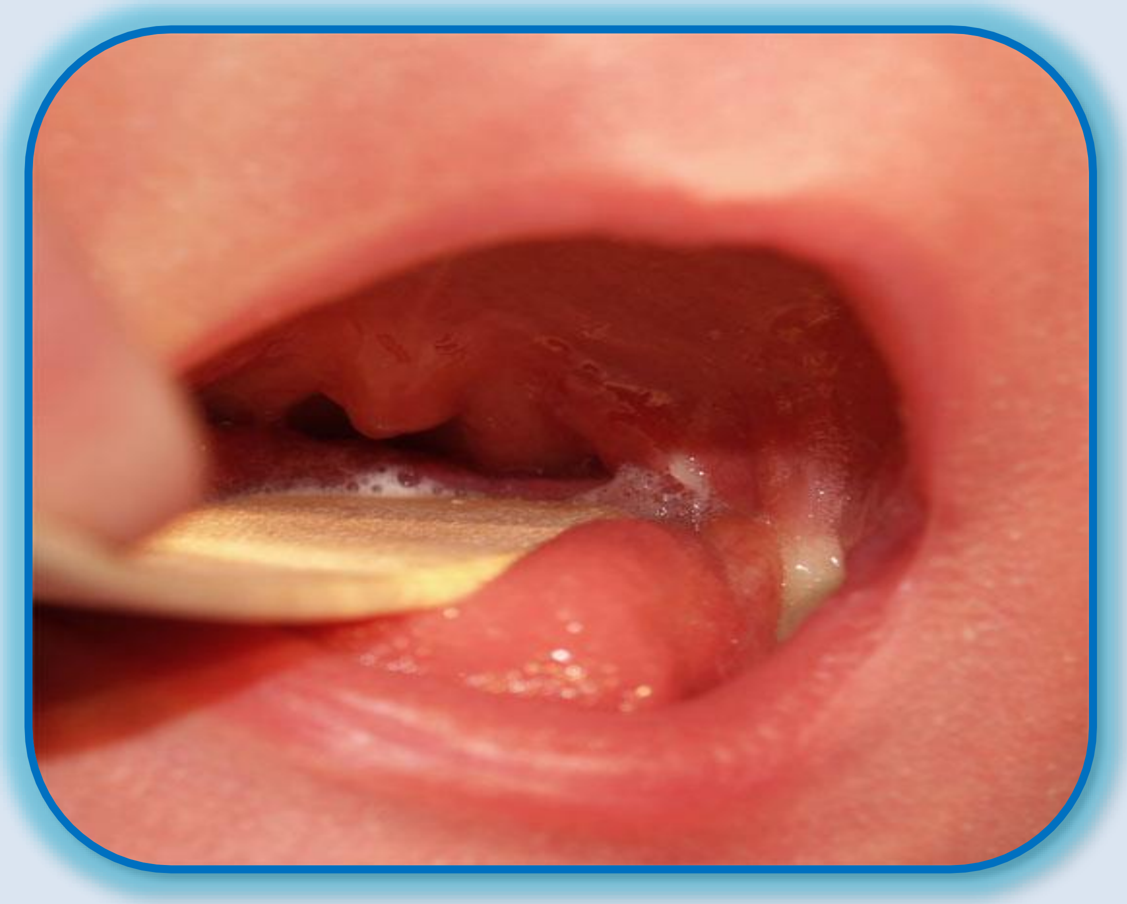
Here is a third example of natal teeth. When palpated, these teeth could be moved slightly, but they were placed low enough in the gum that they do not currently present an aspiration risk. They were not removed.

Cleft Palate



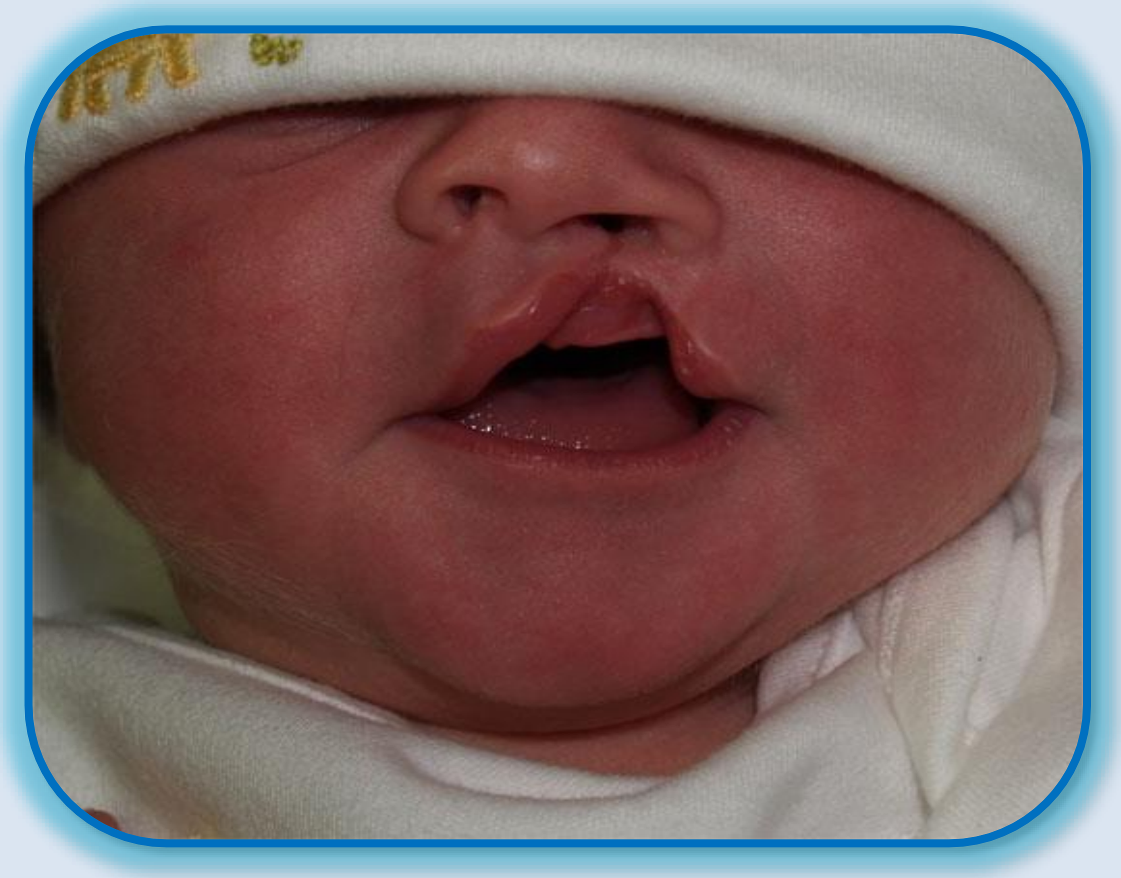
Here, only the lateral margins of the palate are visible. Because the mouth is wide open to the nasal cavity, the NG tube can be seen passing through the nasopharynx as well as the mouth. Cleft palate is not always this obvious. **When examining the palate, the examiner should palpate both the hard and soft palate to check for submucosal and partial clefts**, which are more easily missed.

Bifid Uvula



The uvula is almost twice the normal width, and although it is not clearly bifid, there is a suggestion of two halves. **This finding is known to be associated with submucous cleft** (although clefts can occur with a normal uvula, and bifid uvula may be an isolated finding).

Cleft Lip



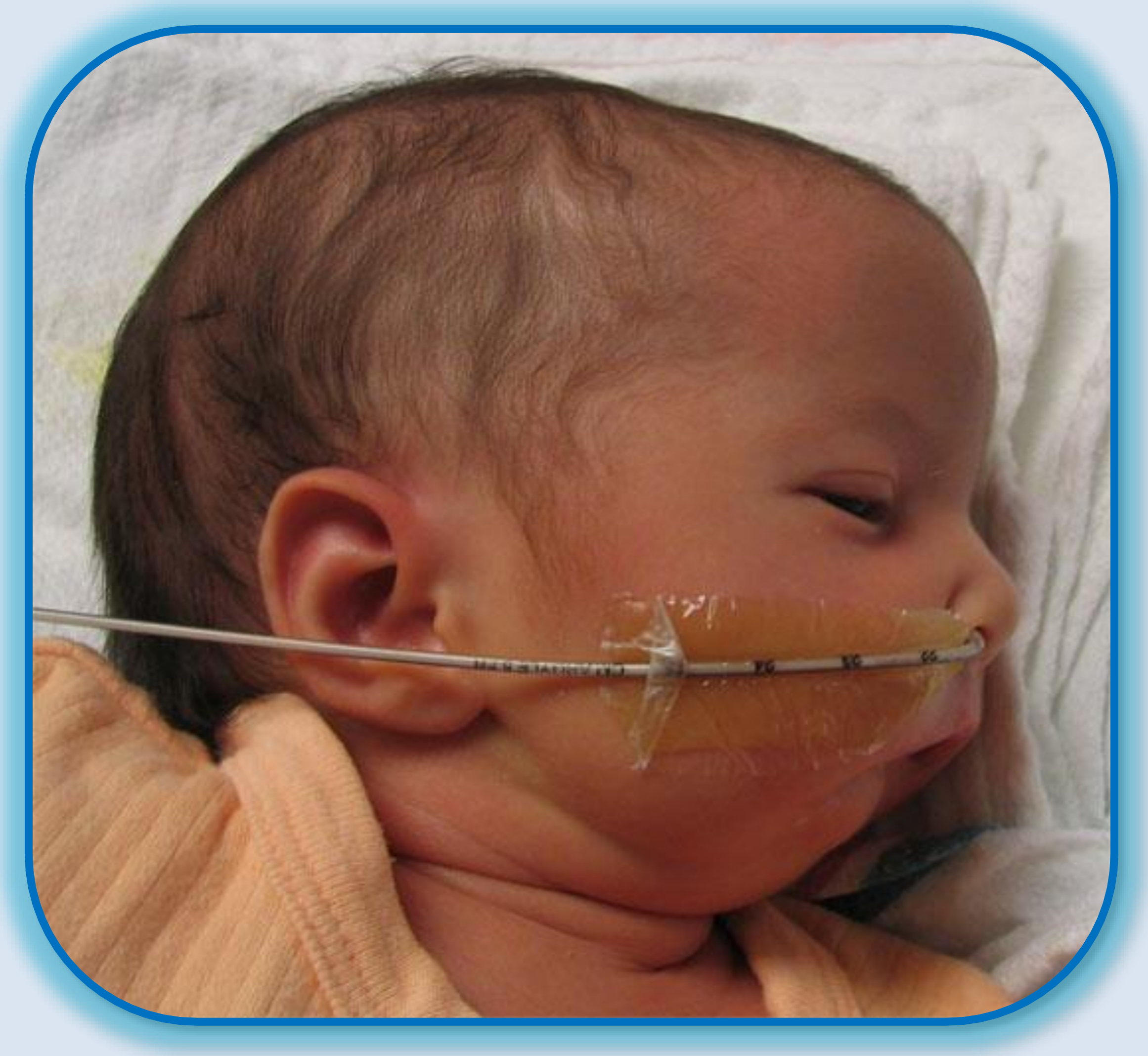
This infant has a normally formed, intact palate, but has a unilateral cleft on the left side.

It is **important** to distinguish unilateral (or bilateral) cleft lip from the more unusual and concerning midline clefts that can occur.

Midline clefts are often associated with underlying **midline defects** in the brain or other structures, whereas the type of cleft pictured above is more likely an isolated finding.

Feeding can be impaired in infants with cleft lip. If needed, a **Haberman bottle feeder** may be helpful.

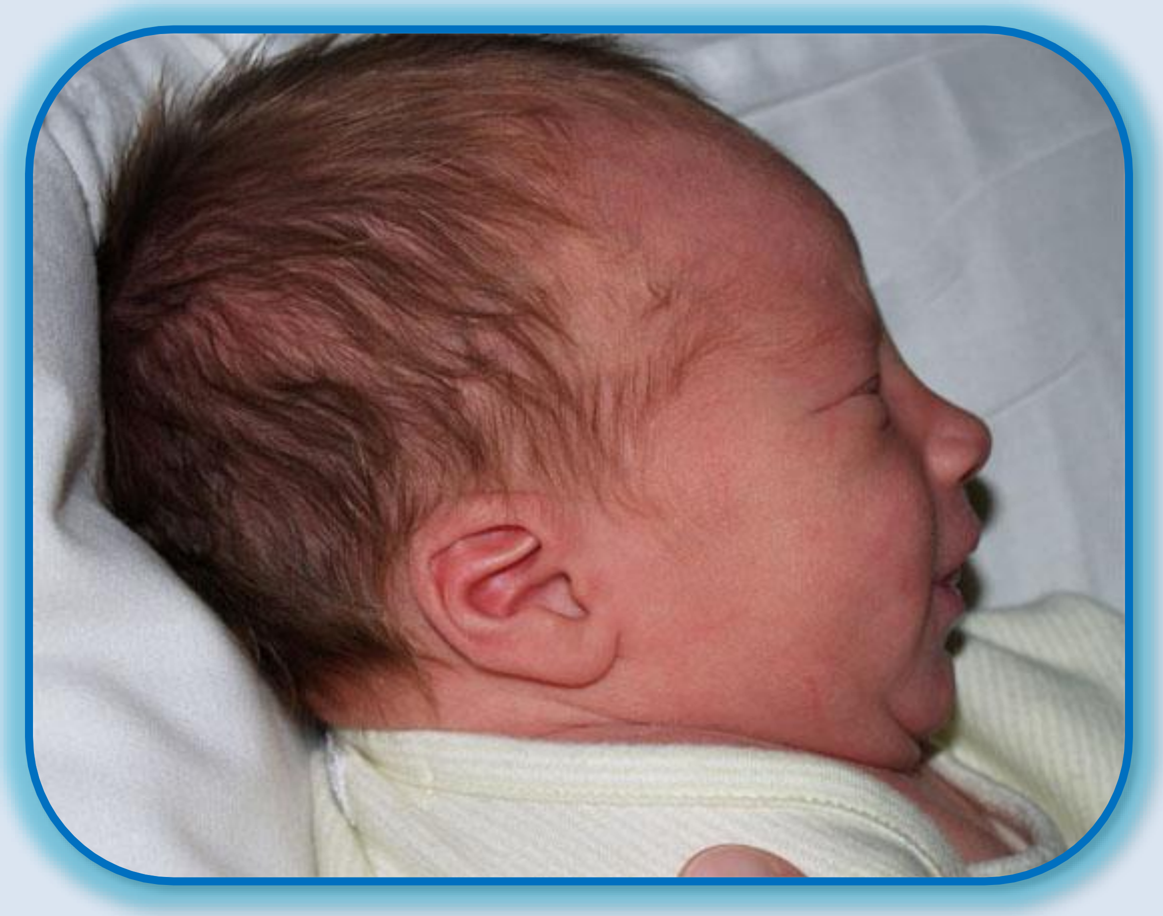
Micrognathia



Micrognathia, or **"small jaw"**, can often be best appreciated when looking at the **profile** of the infant. While many infants may appear to have a slightly **recessed chin**, the appearance above is clearly abnormal.

Underlying genetic conditions should be considered in cases such as this.

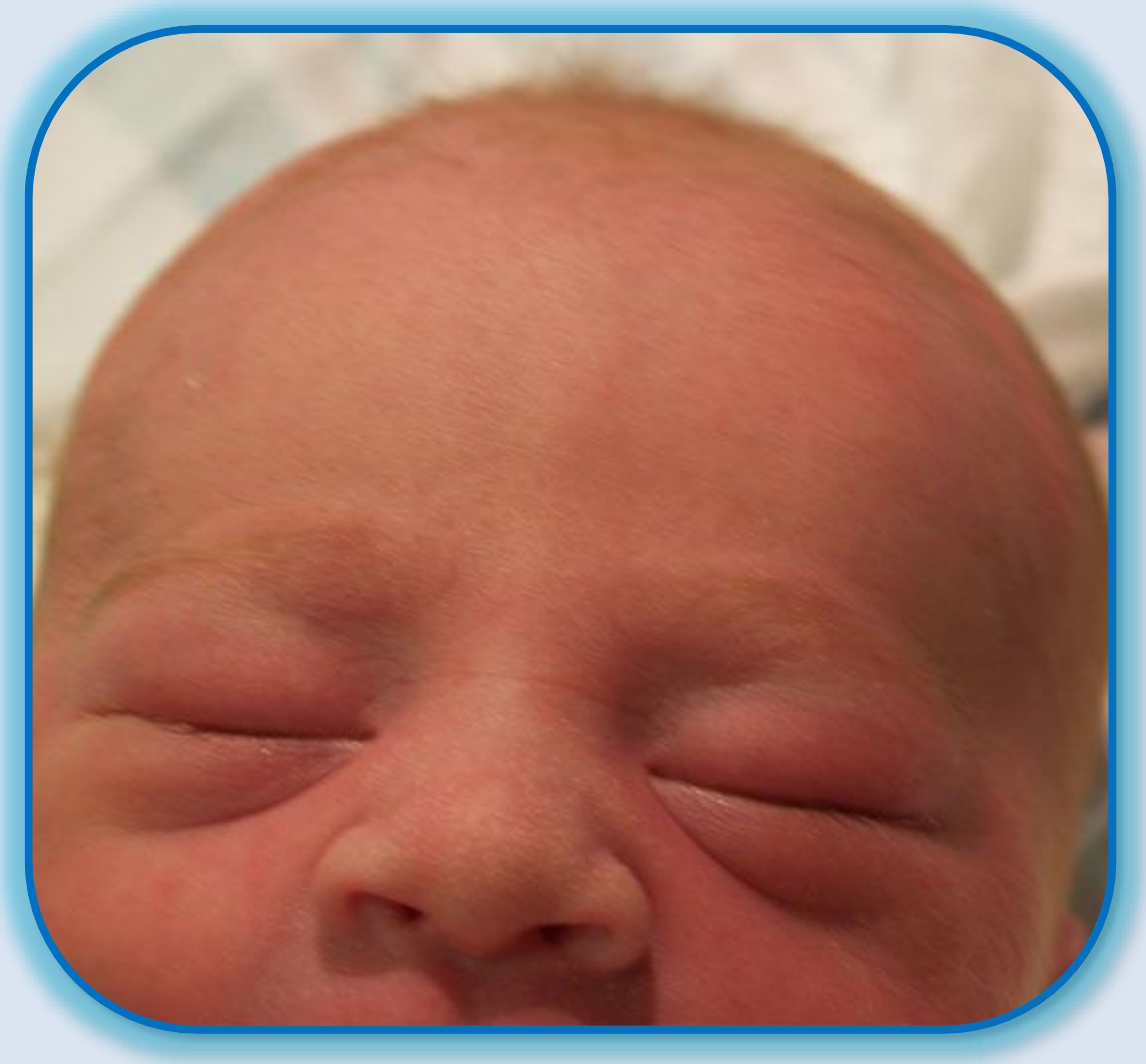
Normal Chin



For comparison, this is a normal newborn. Although the chin is less prominent than the upper lip, this is a normal profile for an infant.

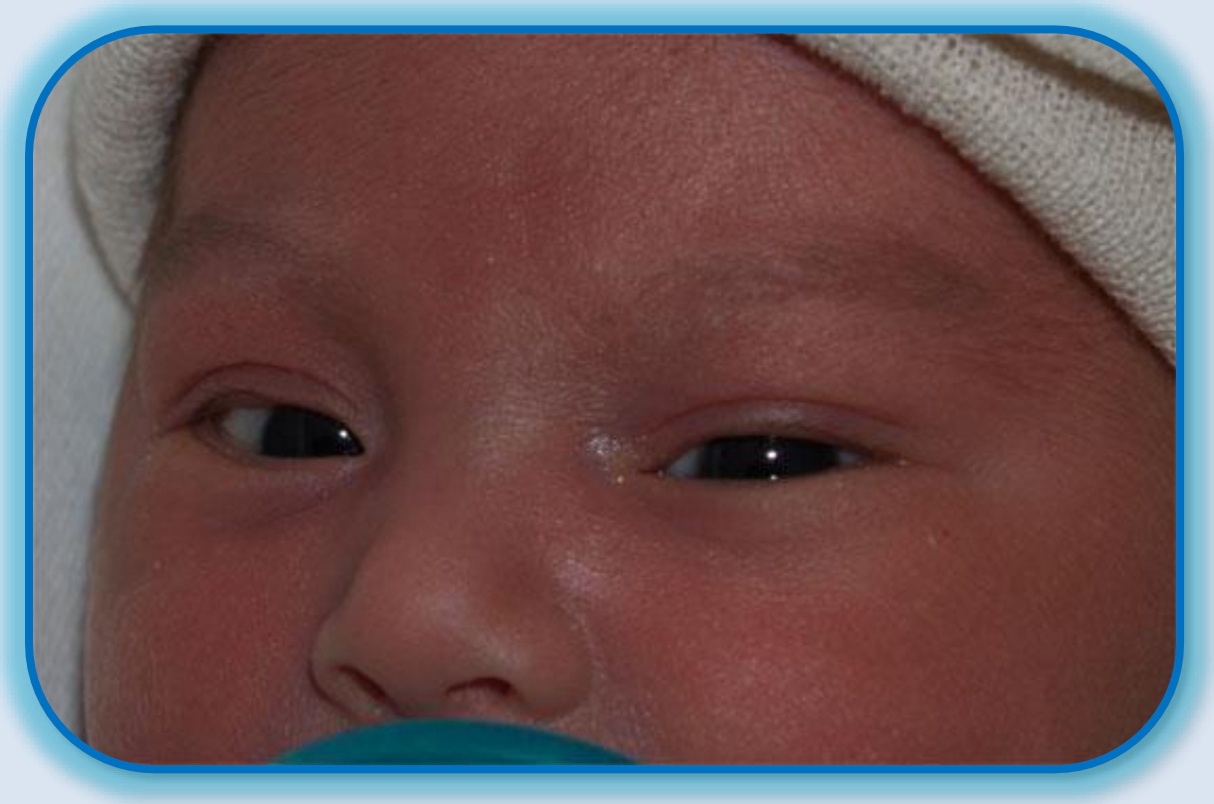
Eyes

Eyelid Edema



Most infants exhibit some degree of eyelid edema after birth. The **puffiness** may make it seem that the infant has difficulty opening one or both eyes, but with a gentle examination, the eye can be easily evaluated. Edema **resolves over the first few days**.

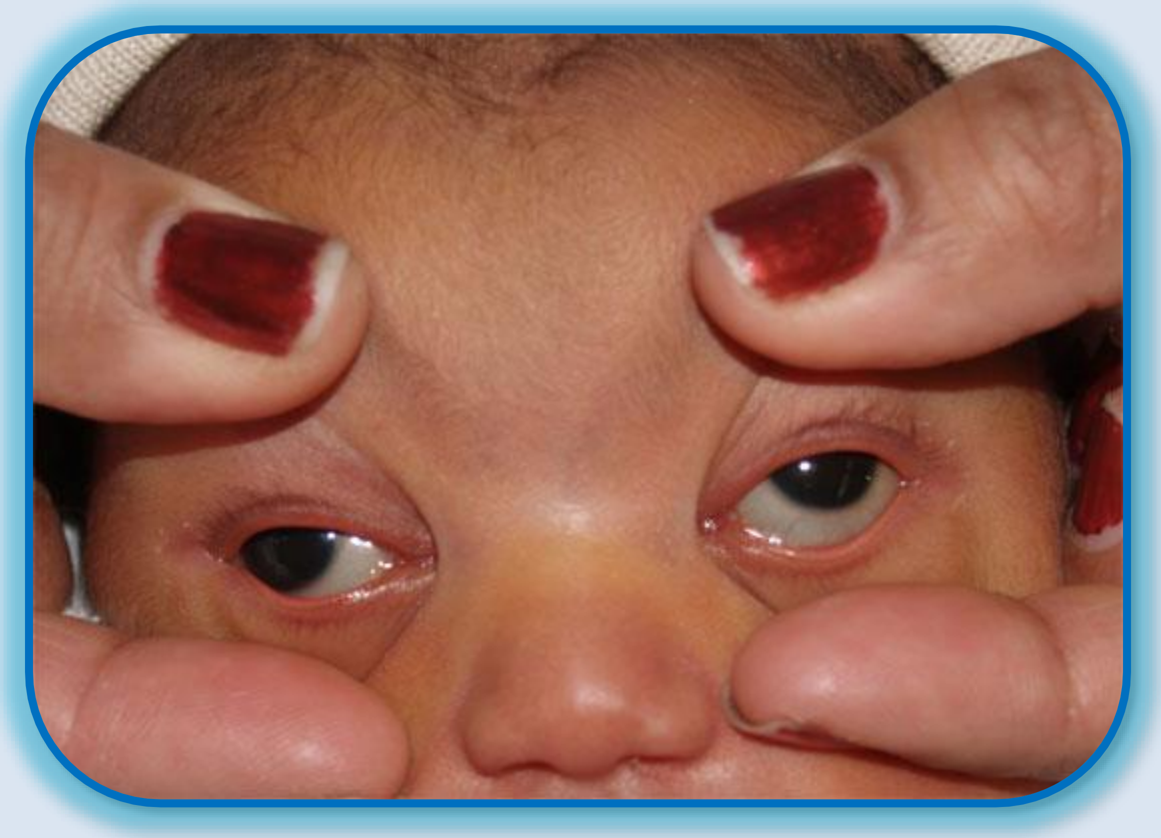
Dysconjugate Eye Movements



During the first few months of life, newborns will frequently have dysconjugate eye movements, where the eyes appear to move independently. Eyes may transiently appear crossed or divergent. This phenomena is particularly noticeable when the infant is falling asleep or being woken from sleep.

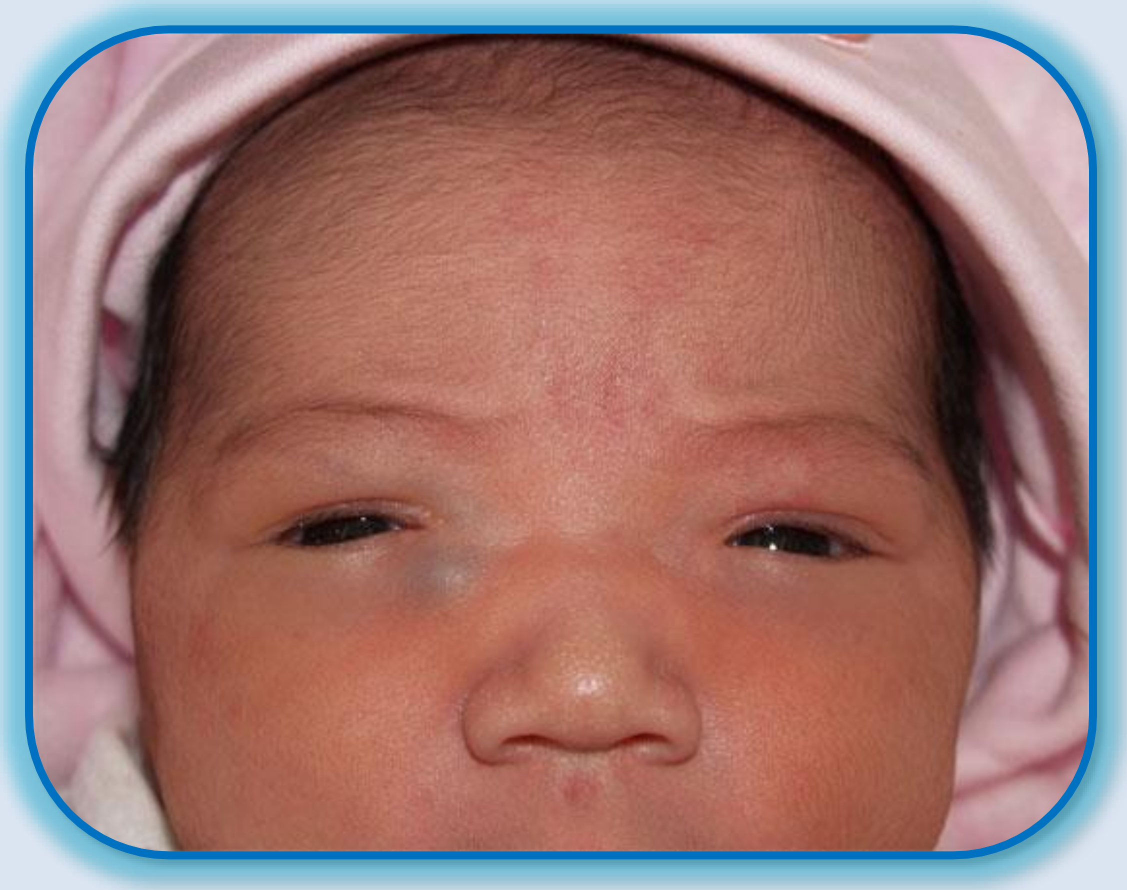
If the dysconjugate movement is **fixed** (one eye is always out, or always in, relative to the other), a pediatric **ophthalmologist** should be consulted. **But if the movements are transient, it is a normal finding and will spontaneously resolve**.

Dysconjugate Eye Movements



Here is another example of dysconjugate eye movements. This infant was sound asleep when the lids were gently opened for the photo. When awake, the infant could easily fix and focus on the mother's face.

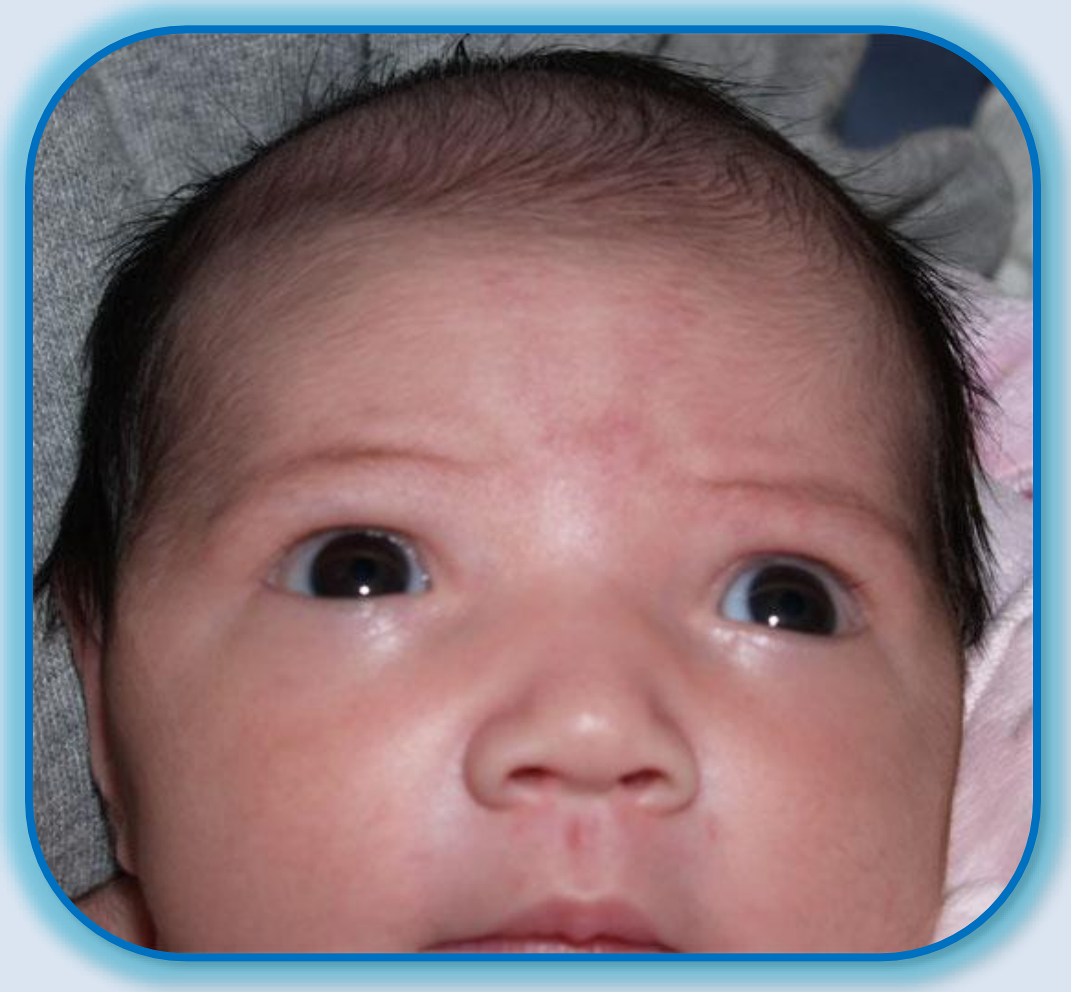
Dacrocystoceles



This infant was noted at birth to have some **bluish nodules** inferior to the medial canthi of both eyes, widely spaced eyes (hypertelorism), and a flat nasal bridge. The nodules are dacrocystoceles. They are caused by obstructions at both superior and inferior ends of the nasolacrimal duct.

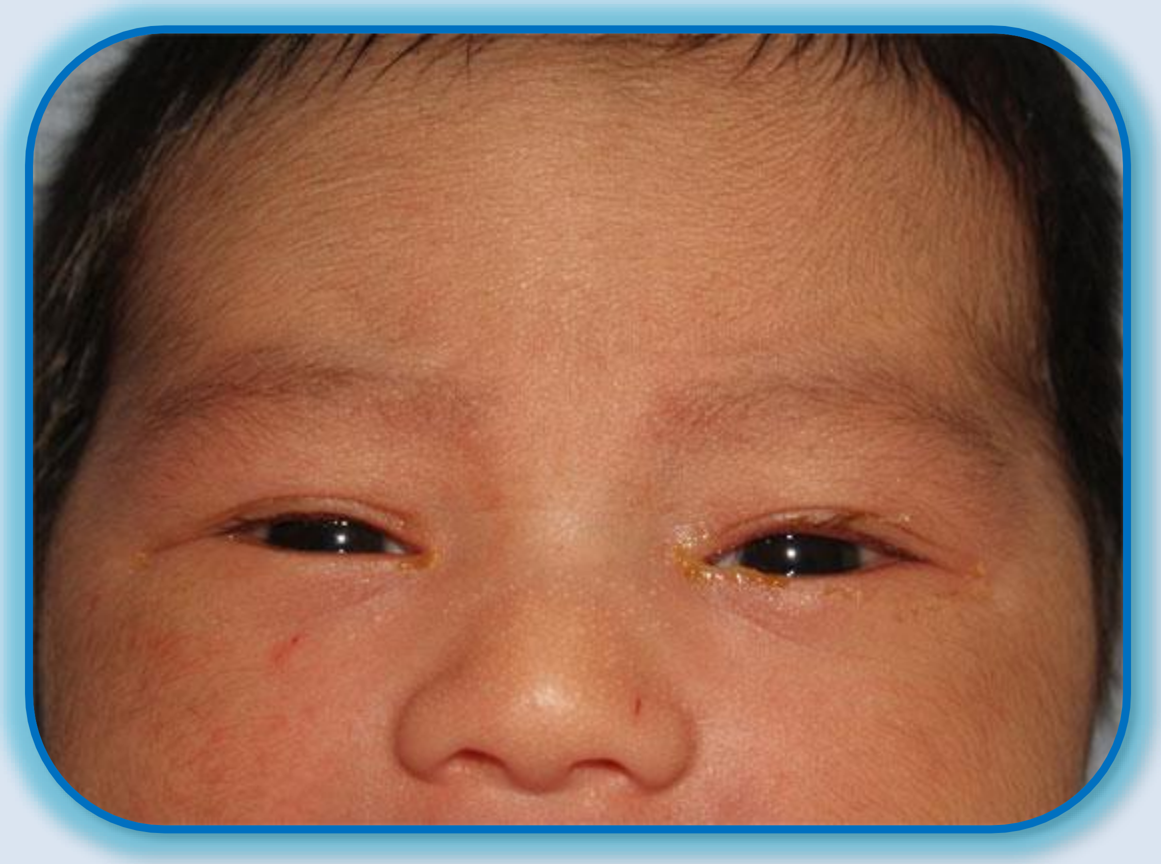
Though relatively small externally, these lesions almost completely obstructed the nasal passages. For this reason, internal nasal evaluation is recommended when the dacrocystoceles are bilateral, even when the patient is otherwise asymptomatic.

Dacrocystoceles



Approximately 4 days **after surgery**, the bluish discoloration and the lumps medial to the eyes are gone. There is also a diminished appearance of hypertelorism (which is exaggerated in patients with bilateral dacrocystoceles).

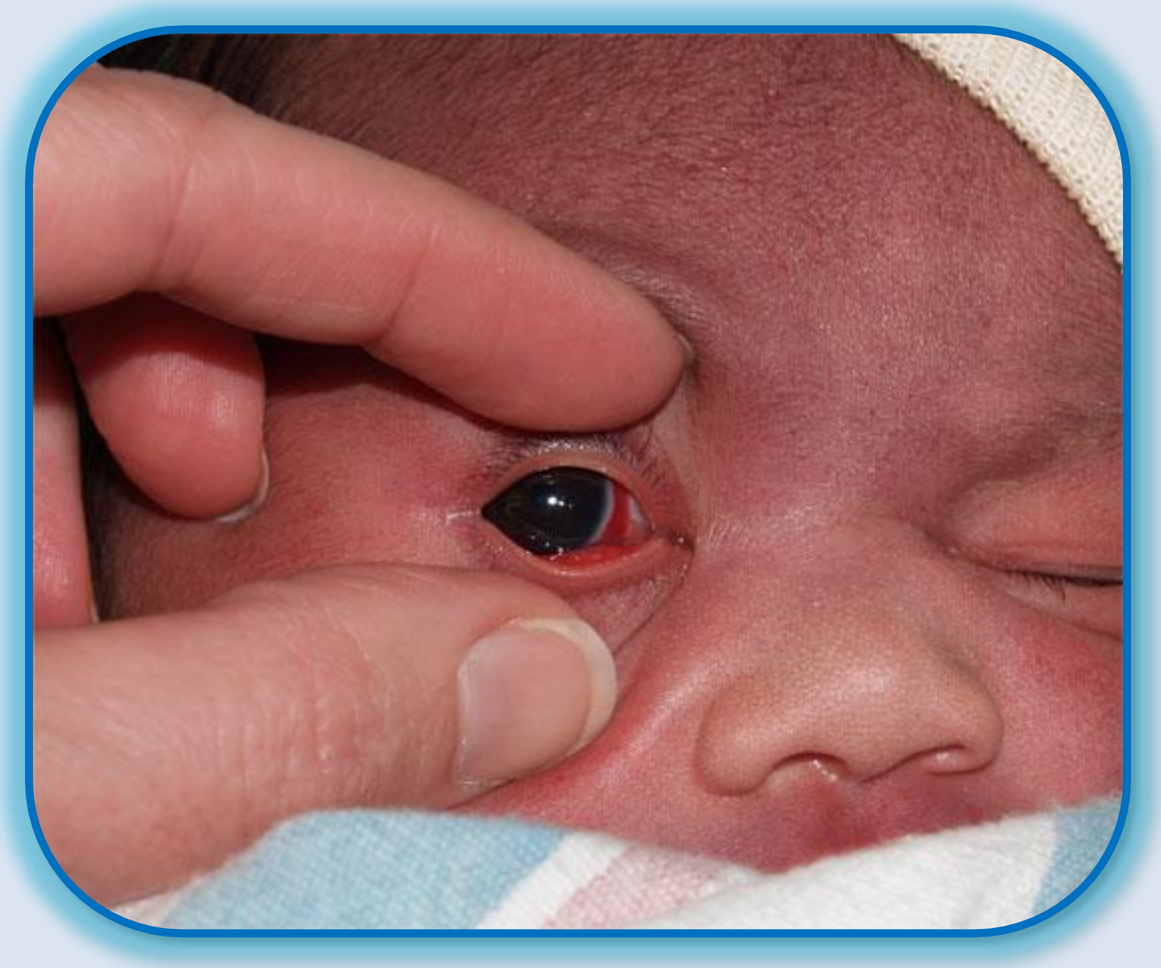
Dacrostenosis



In this baby, both eyes are affected, although there is slightly more **discharge** around the left eye than the right. The **sclera** of both eyes are **clear**, and there are no other signs of infection.

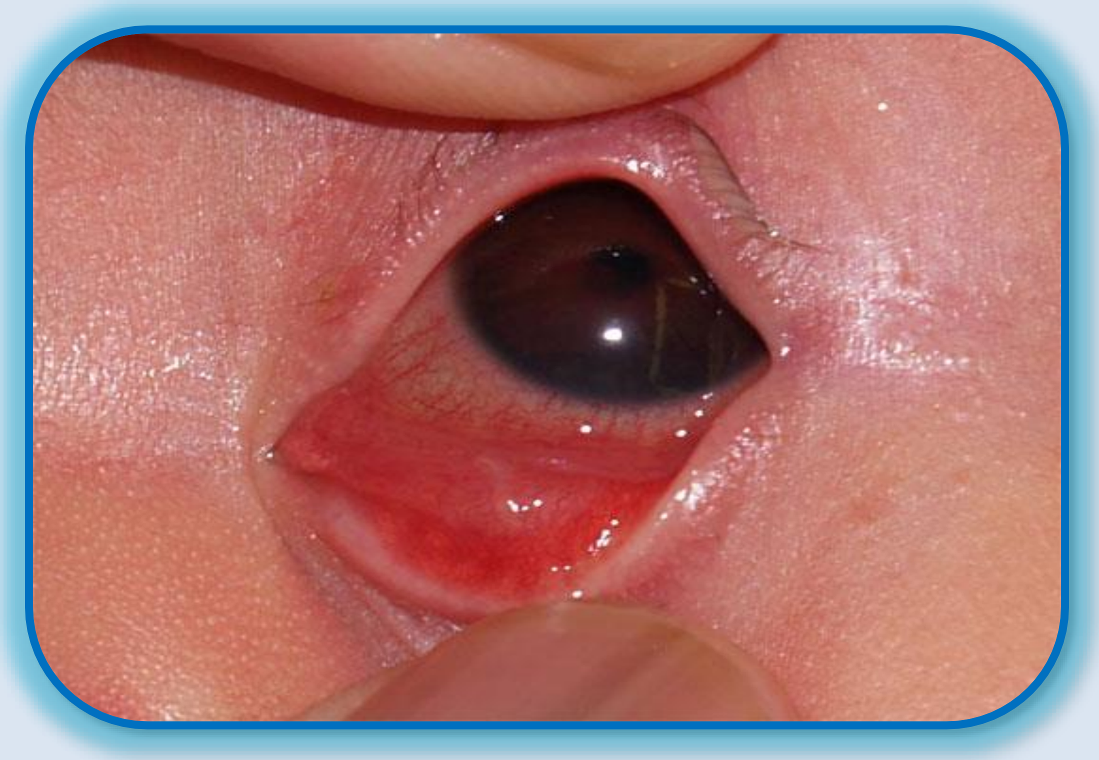
For about **half** of affected patients, this **will resolve within the first week of life**. For the **other half**, spontaneous resolution is expected in **several weeks to a few months**.

Subconjunctival Hemorrhage



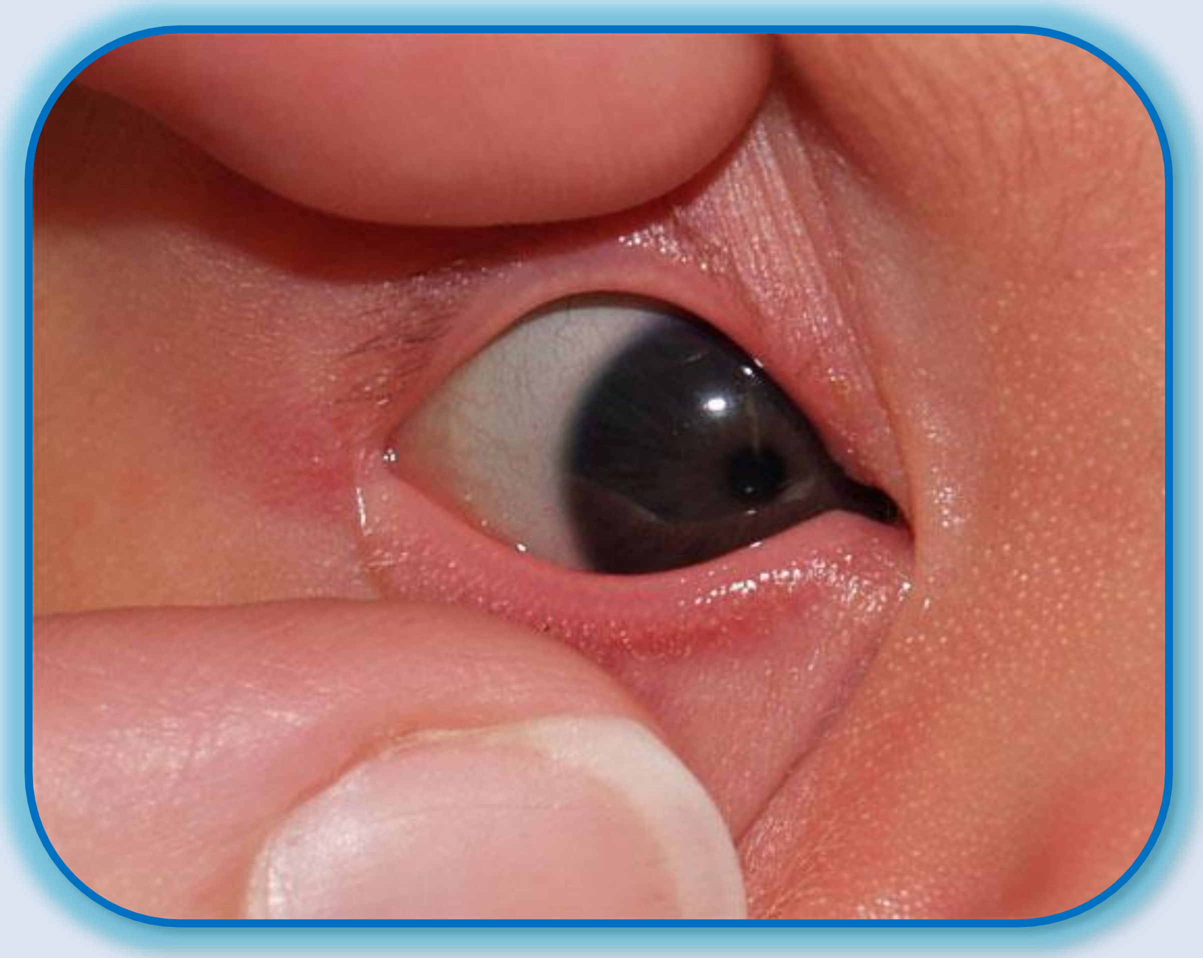
Subconjunctival hemorrhage is a **frequent** finding in normal newborns. It results from the breakage of small vessels during the pressure of delivery. The red area may be large or small but is always confined to the limits of the sclera. It is **asymptomatic**, does not affect vision, and **spontaneously resolves** in several days. Note also the numerous **petechiae** on the forehead. This infant had significant facial bruising as well as the eye finding.

Iris Cyst



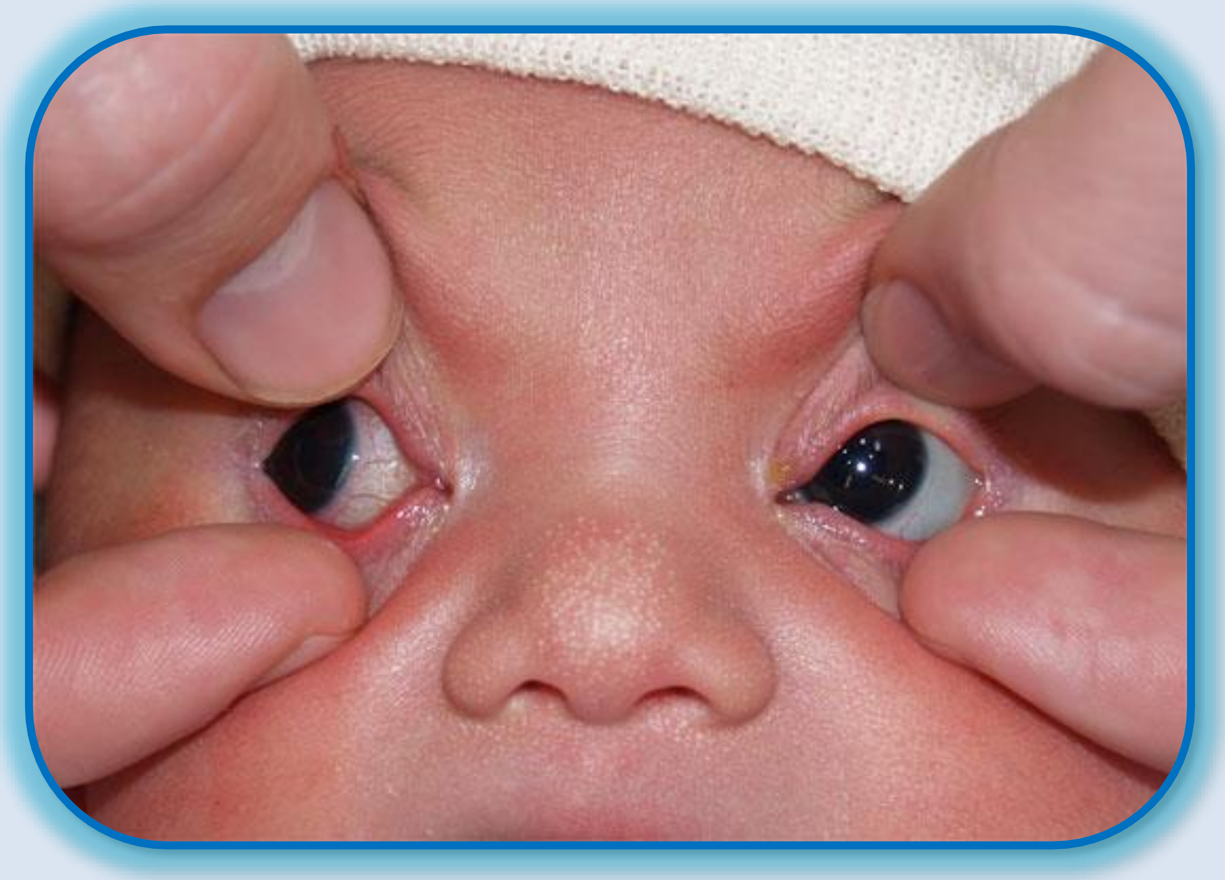
On examination of this infant, he was found to have markedly injected sclera and absent red light reflex. With careful inspection, a reddish discoloration over the iris, and opacity within the pupil can be seen. This is presumed to be an iris cyst, an extremely **rare** finding. Interestingly, this cyst **spontaneously resolved** over the next few months.

Normal Eye



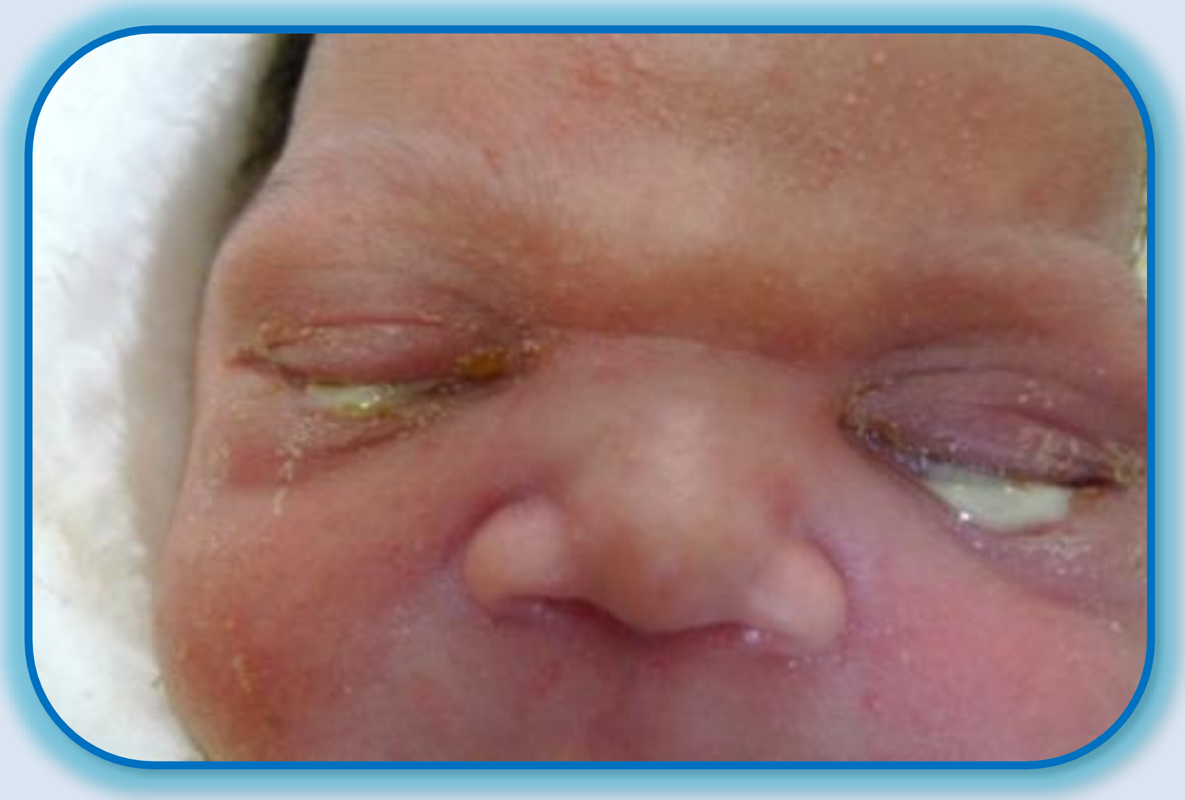
For comparison, this is the completely normal right eye of the same infant. Note the lack of injection in the sclera, the normal grayish blue iris and the clear pupil. A red reflex was easily obtained in this eye. Although gonococcal conjunctivitis was initially in the differential diagnosis, the lack of significant discharge and the unilateral nature made bacterial conjunctivitis unlikely.

Injected Eye



A newborn with unilateral conjunctival injection. On initial examination, the right pupil was about 2mm in diameter and the normal left pupil was 5-6mm. Absent red reflex on the right side and the retina could not be well seen. The differential diagnosis includes tumor and vascular abnormalities. An ultrasound of the eye was done to evaluate this finding further.

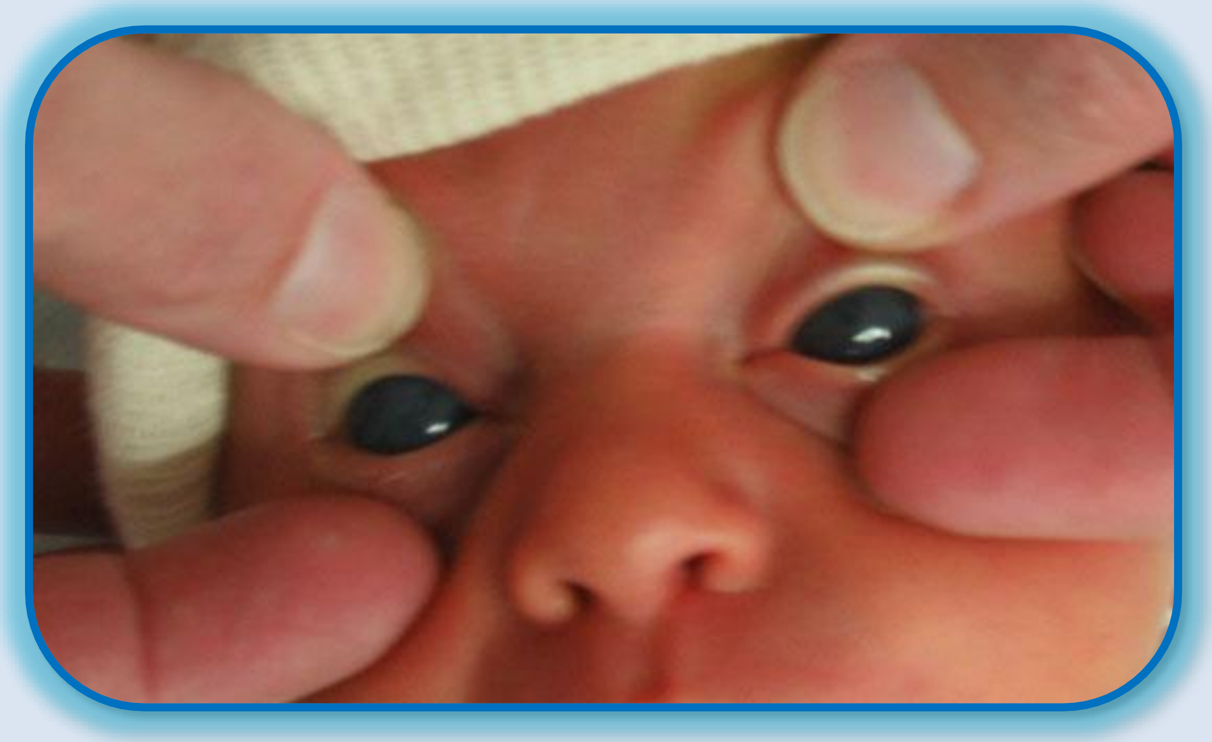
Gonococcal Conjunctivitis



When gonococcal conjunctivitis occurs, it typically presents in the **first few days** of life with copious, **purulent discharge** in the eyes. In this infant, the marked **edema** of the eyelids was the first symptom noted, but with just slight pressure on the lids, purulent material oozed out.

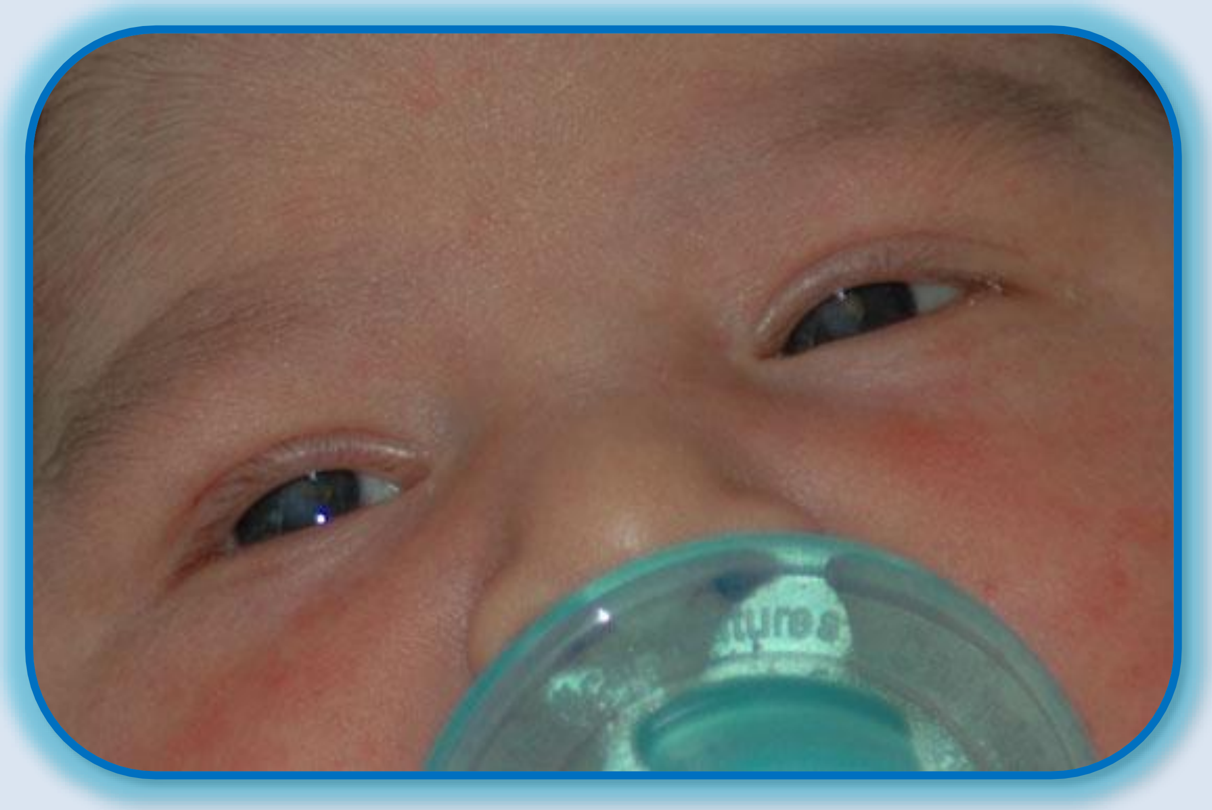
Unlike the typical "pink eye" conjunctivitis that occurs in older children, gonococcal conjunctivitis is an ophthalmologic **emergency**. Because the bacteria can **erode** through an intact cornea, **treatment is very aggressive** and includes systemic intravenous antibiotics, frequent eye washes, and monitoring in a neonatal intensive care unit. Fortunately, this diagnosis is very uncommon in places where **prophylactic antibiotic eye ointment is used at birth**.

Congenital Glaucoma



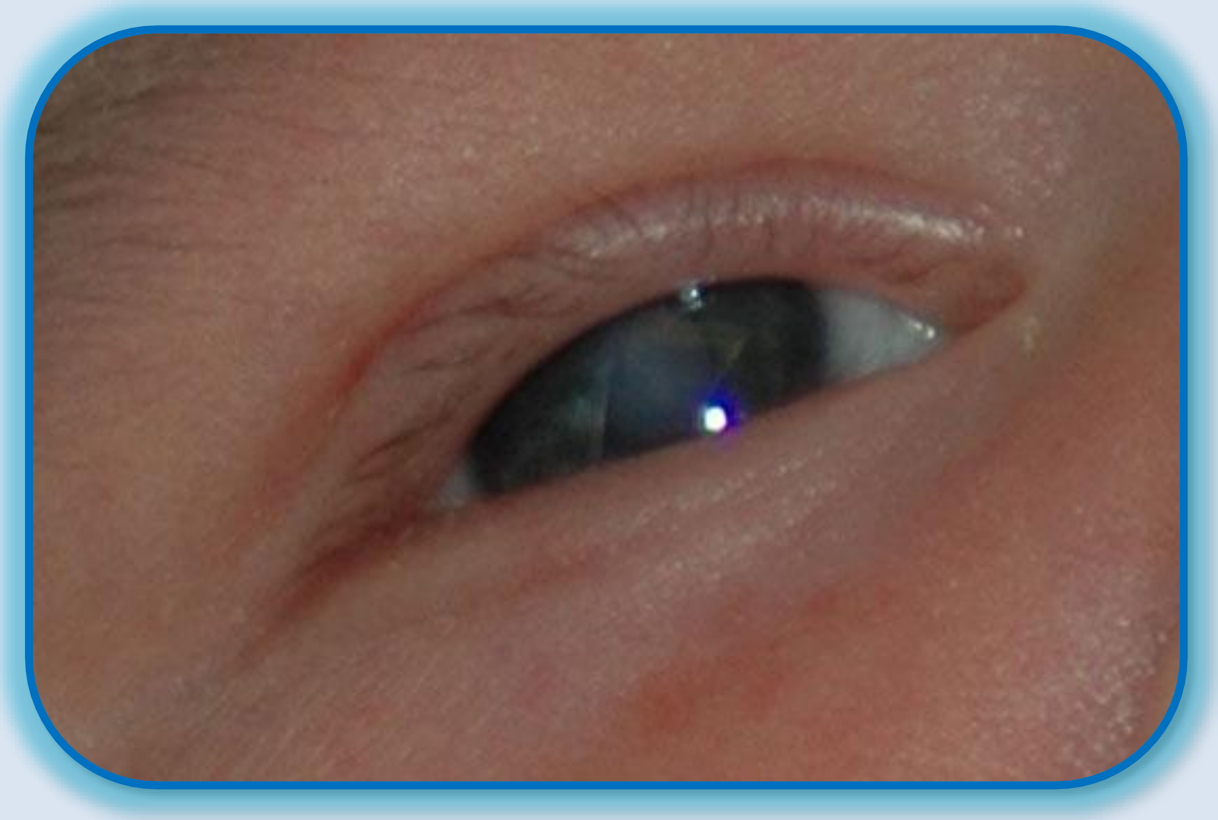
This infant presented with **hazy bilateral corneal opacities** on the initial newborn exam. The diagnosis was relatively easy as there was a strong family history of congenital glaucoma.

Peter's Anomaly



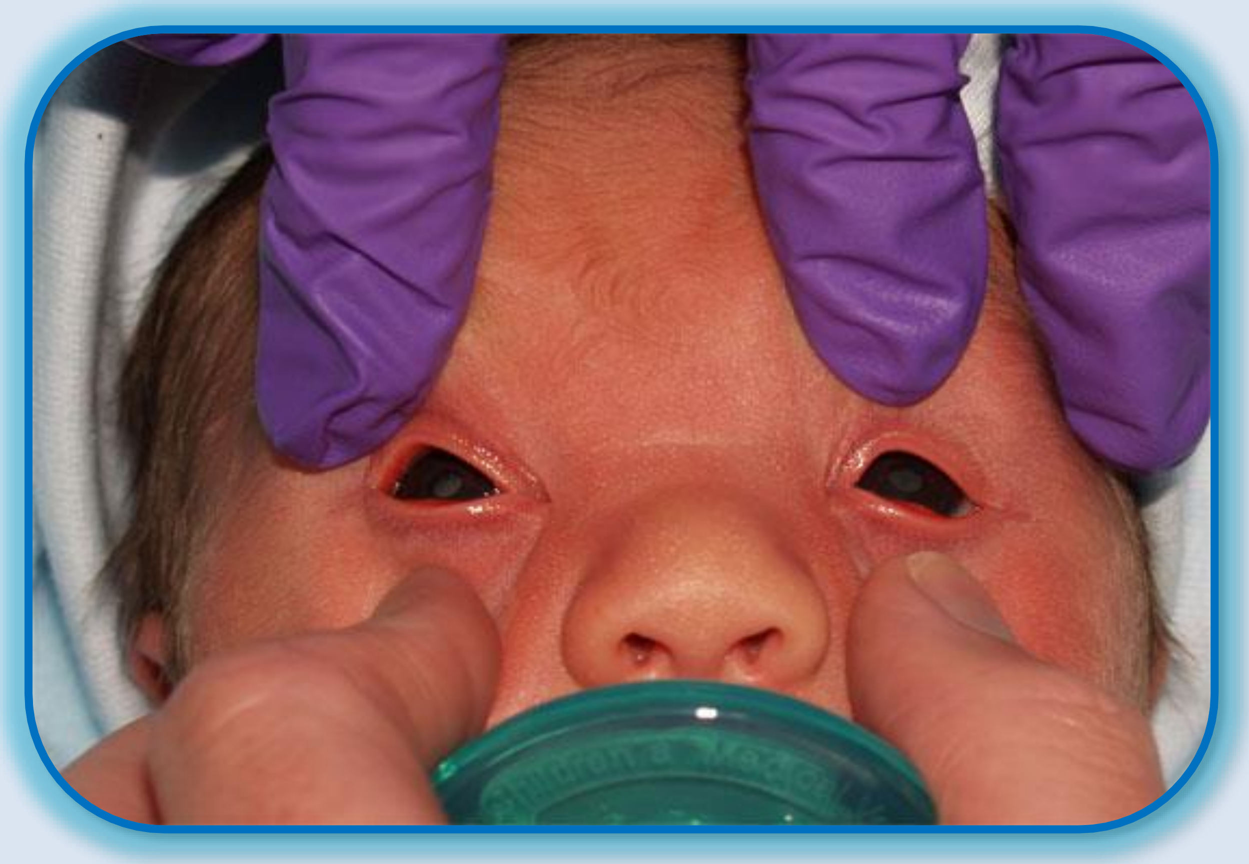
This infant is has **bilateral haziness of the central corneas** visible without special equipment. On evaluation with an ophthalmoscope, **red reflexes could not be seen** in either eye due to these opacities.

Peter's Anomaly



The same infant as the previous photo. Although the opacity is central and could be mistaken for opacity of the lens, a view from a more oblique angle shows the **cloudiness extends over parts of the iris** as well.

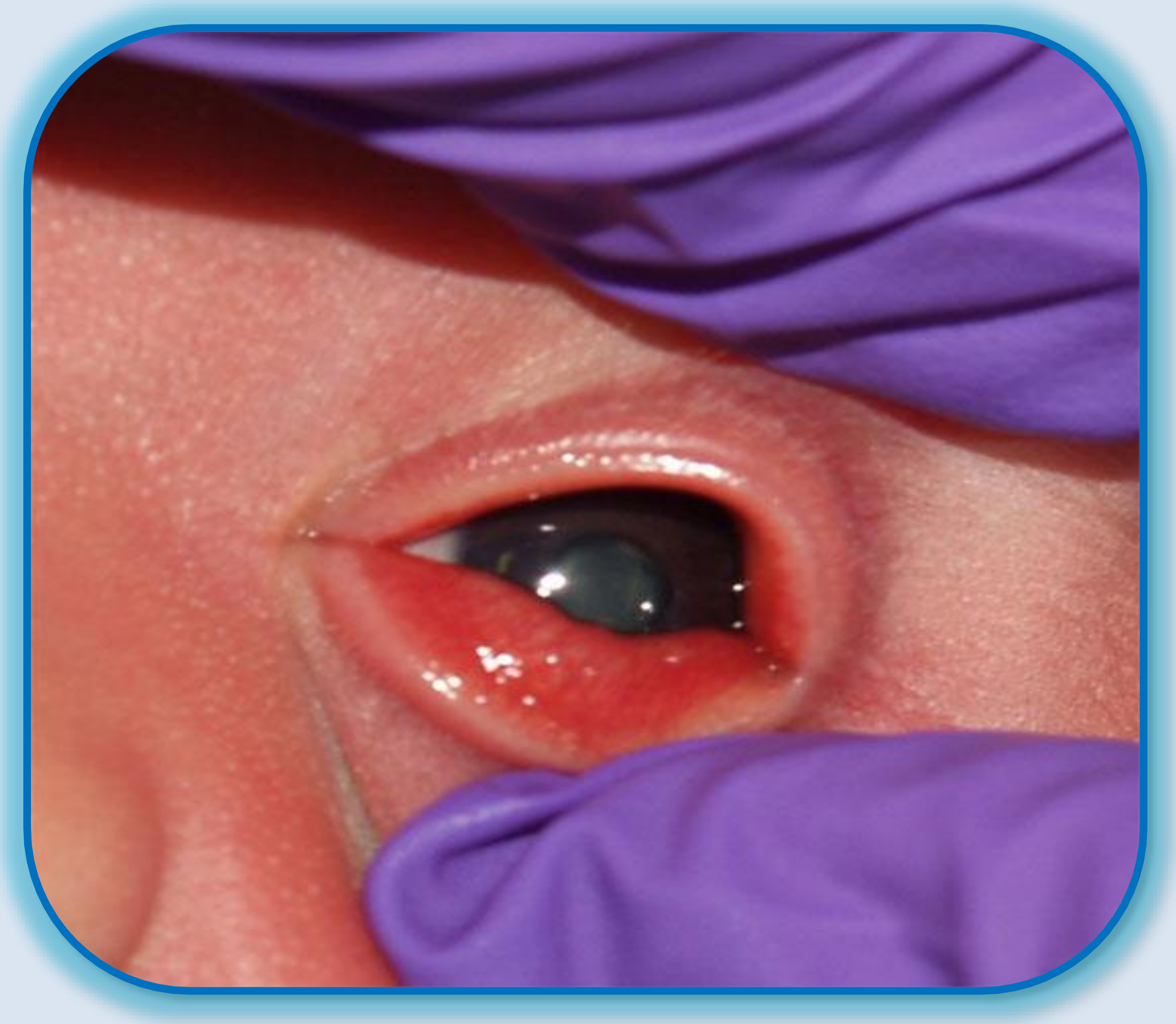
Congenital Cataracts



In contrast to the previous photos, the **opacities** here occur **behind the pupil**, as the pupil is easily and clearly seen along its entire circumference. Again, the opacity can be appreciated without any special equipment. **Red light reflexes could not be obtained** from either eye.

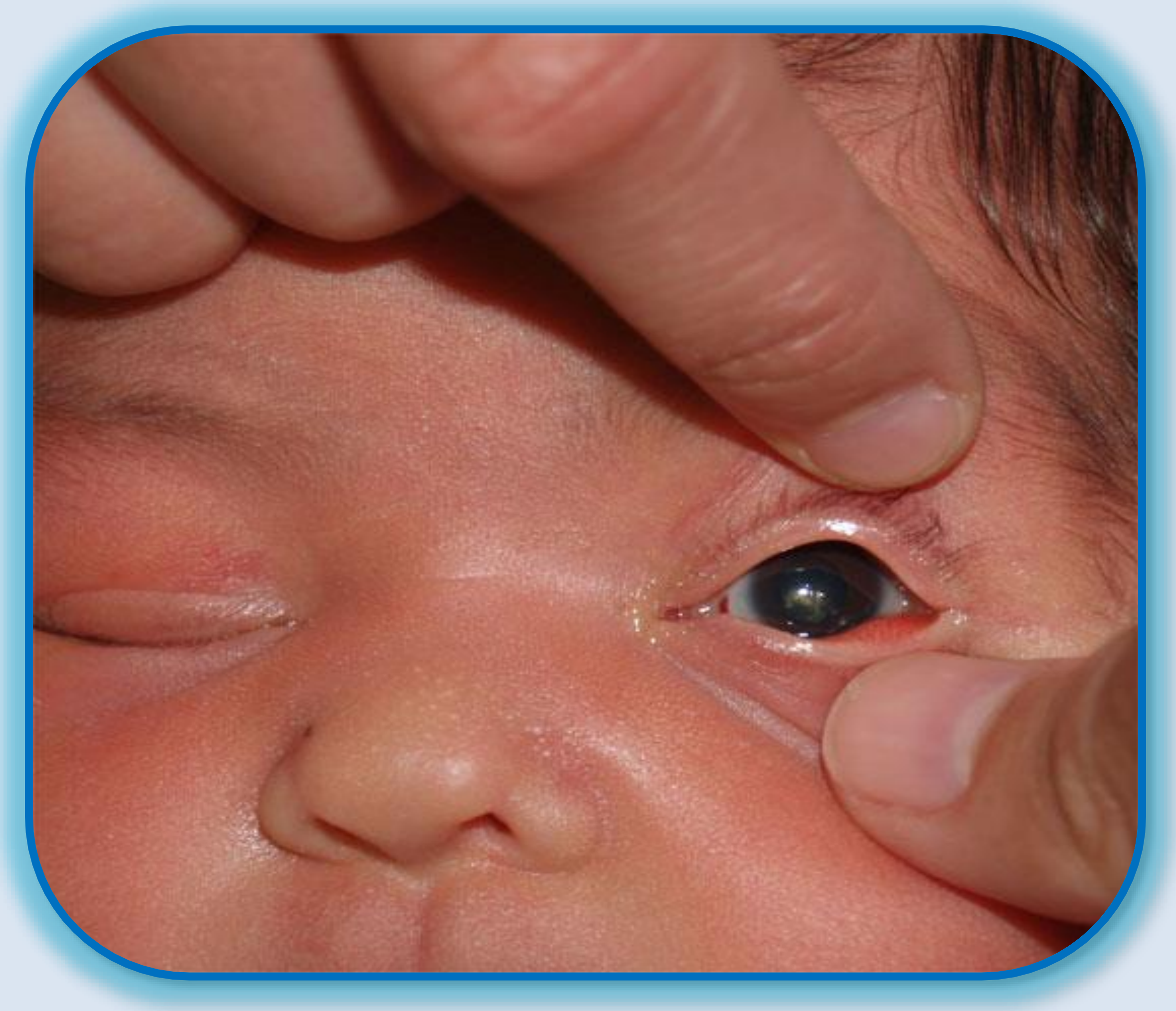
This finding needs **workup** to identify the underlying etiology, as a long list of metabolic, infectious, and genetic disorders are associated with cataracts. This infant was otherwise well and had a positive family history of congenital cataracts, so **autosomal dominant inheritance** was suspected.

Congenital Cataract



With a closer view, cloudiness within the pupil is clearly seen. Congenital cataracts **require early intervention** to preserve sight, so **immediate referral** to a pediatric ophthalmologist is indicated. It is important to remember that cataracts that are less dense may not be visibly cloudy, **so any time red reflexes cannot be obtained on exam, even if the eye appears grossly normal, referral is required**.

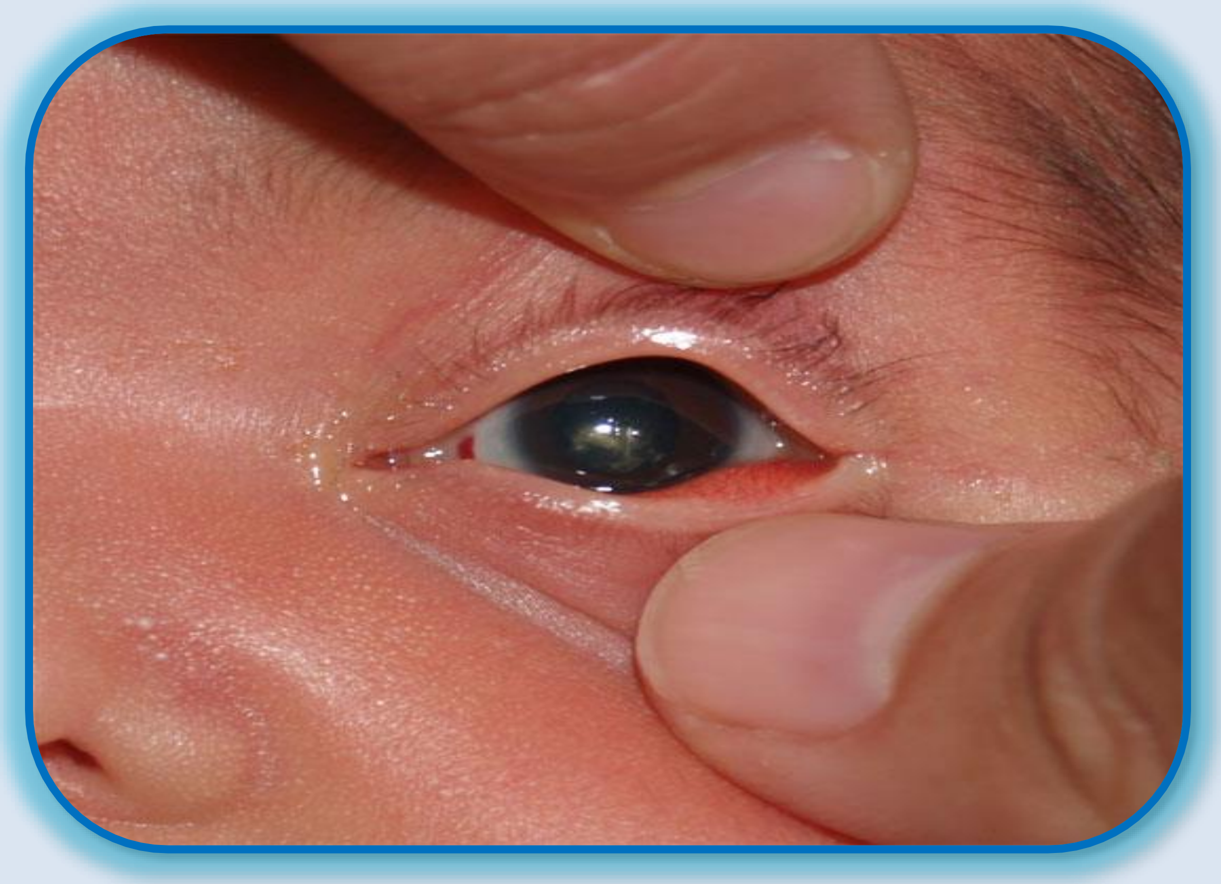
Congenital Cataract



This cataract was less obvious on initial exam. When the pupil was not dilated, only a hint of white was appreciated. The more notable finding was the **lack of a red reflex**.

After dilating drops were placed, the opacity was more visible. Even though this cataract is not as dense as the one in the previous photo, **surgical correction within the first two months of life is still necessary** to preserve sight.

Congenital Cataract

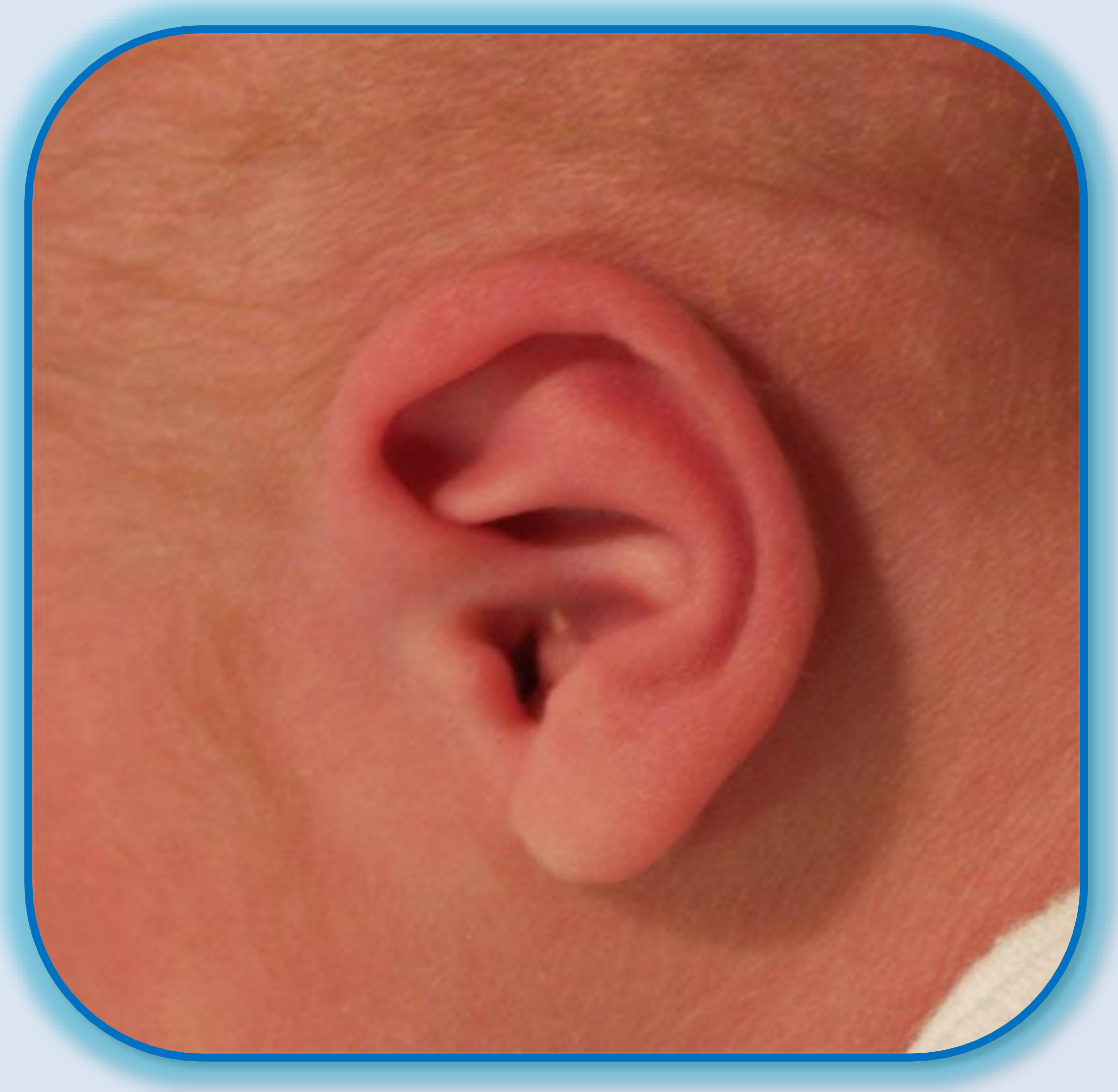


With a closer look, the opacities can be seen as smudges of white in the inferior pupil. This is a **lamellar cataract**. Again, newborns with congenital cataracts **should be evaluated** for underlying metabolic, genetic, or infectious conditions. **Only 20% of patients with cataracts will have an identifiable cause**, but when associated conditions occur, prompt recognition and treatment can prevent further complications.

A subconjunctival hemorrhage is seen (a frequent finding shortly after birth). It is benign and unrelated to the cataract.

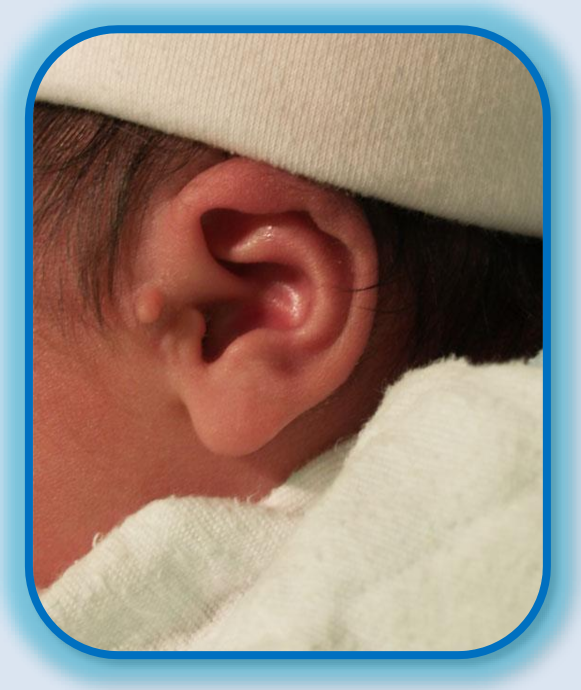
Ears

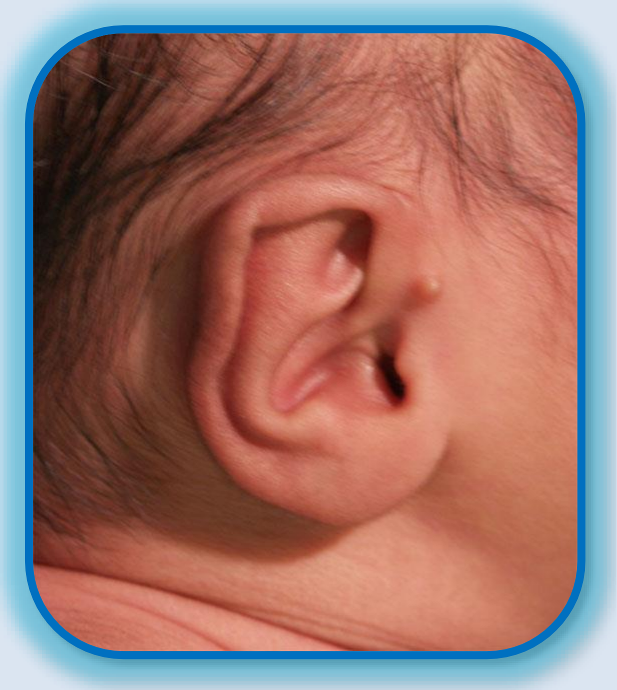
Normal Ear



Many variations in size and shape exist within the label of "normal ear", but in general, the normal ear is one in which all the structures (helix, antiehelix, tragus, antitragus, scaphoid/triangular fossa, and external auditory canal) are all present and well formed.

Ear Tag

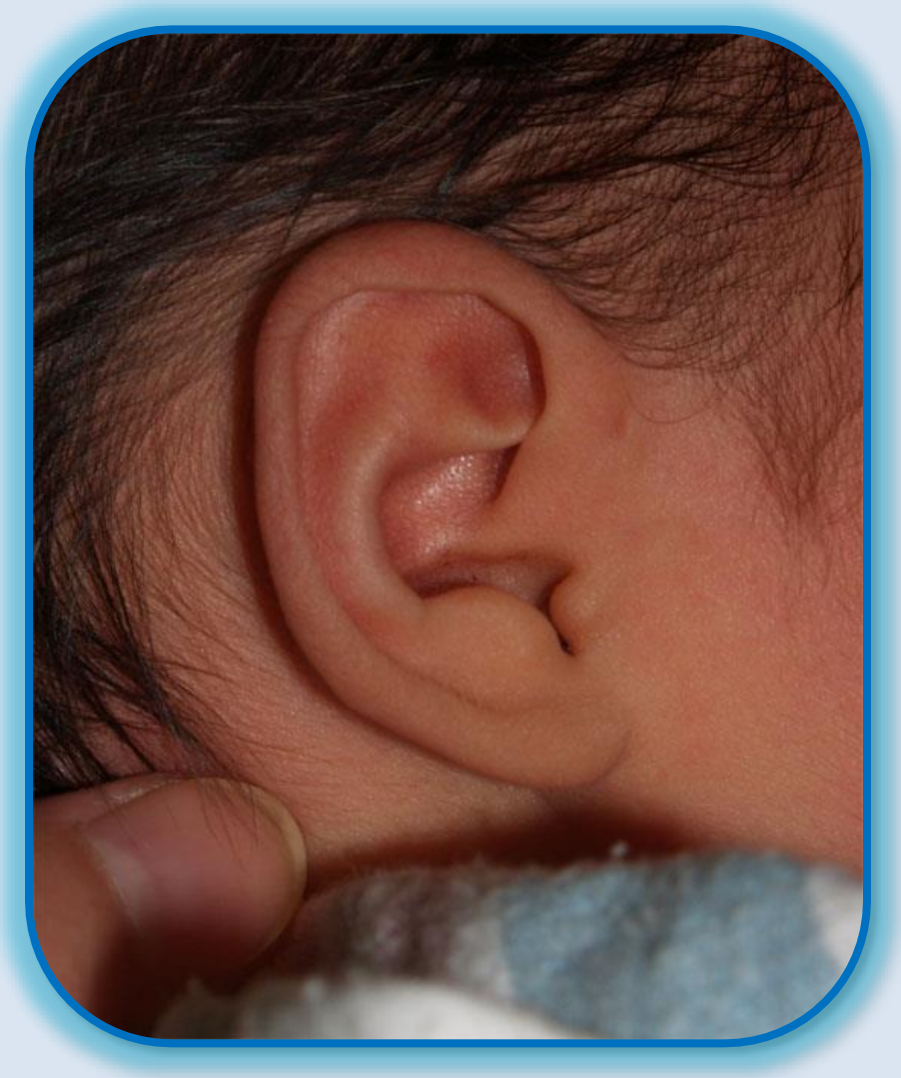




A single, small ear tag is an **occasional** finding on physical examination.

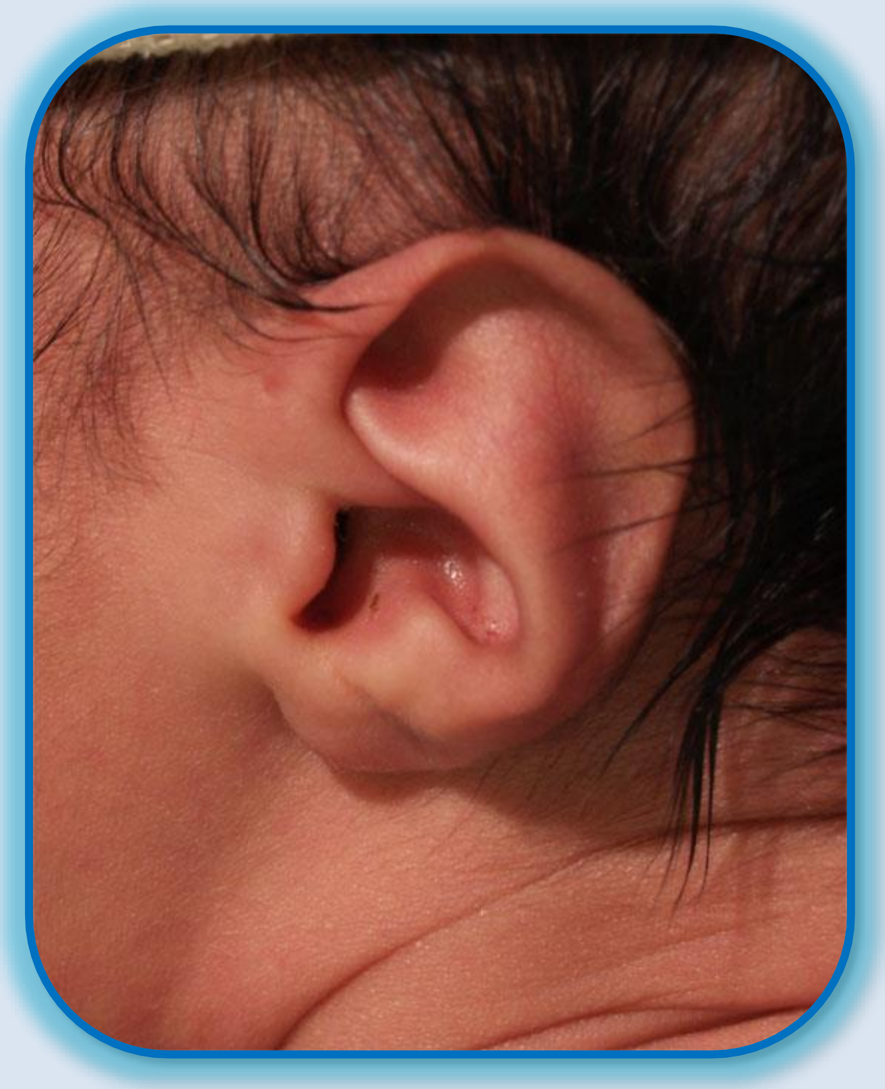
It is **often inherited** as a familial trait.

Ear Pit



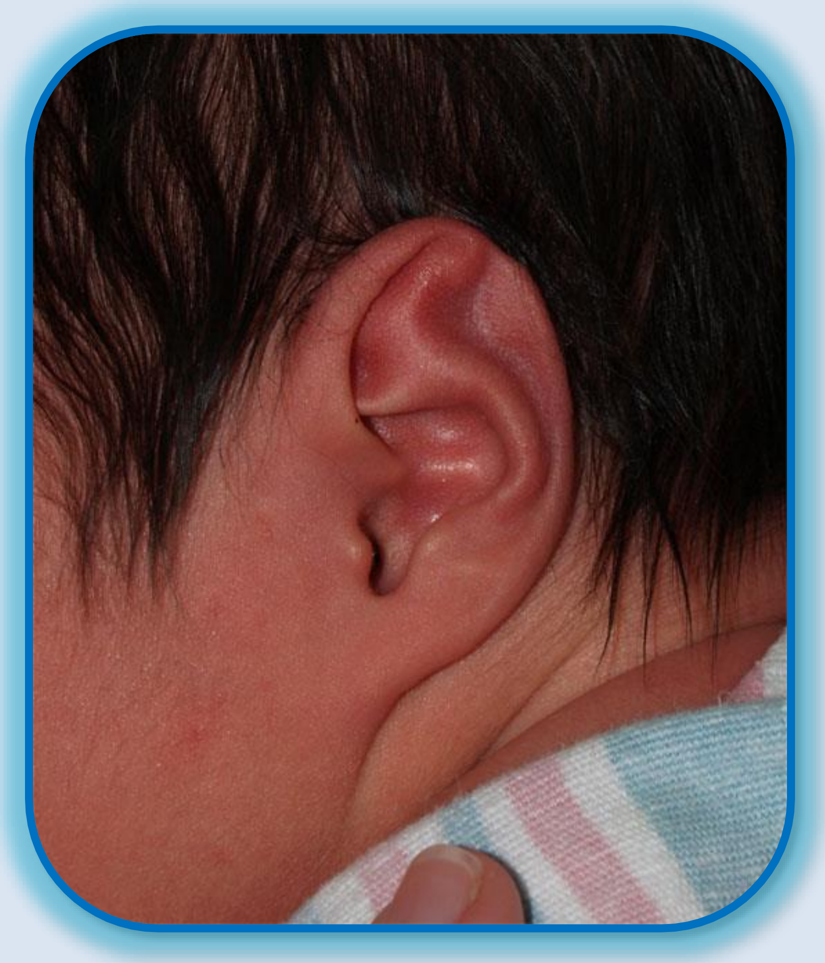
Ear pits (preauricular pits) are often a rather subtle finding on physical exam. They are located at the superior attachment of the pinna to the face and may be unilateral or bilateral. Up to **10% of Asian infants** will have pits (they are less common among caucasians and African Americans). There is a **rare association** between ear pits and **Brachio-Oto-Renal Syndrome** so **audiologic testing** of these infants is recommended, but otherwise this is considered a benign finding.

Ear Pit



Another example of an ear pit in a newborn. With an isolated pit, renal ultrasounds are not generally recommended unless there is a positive family history of deafness, renal pathology or auricular malformations, or when the mother has a history of gestational diabetes.

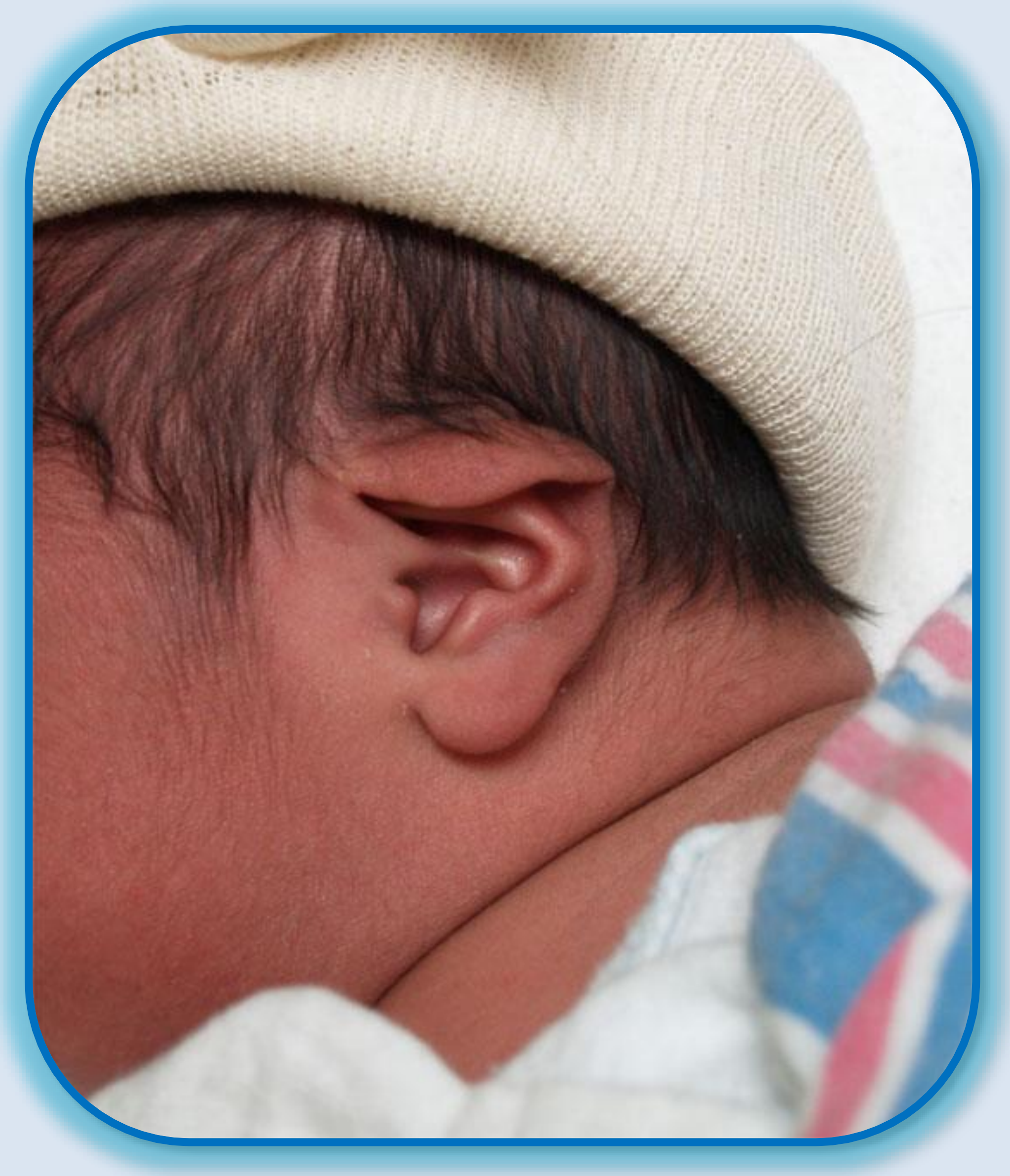
Stahl's Ear



Also known as **Satyr ear**, **Spock ear**, or **Vulcan ear**, this deformity of the pinna is characterized by a **flat helix at the superior pole** and a flattened scaphoid fossa.

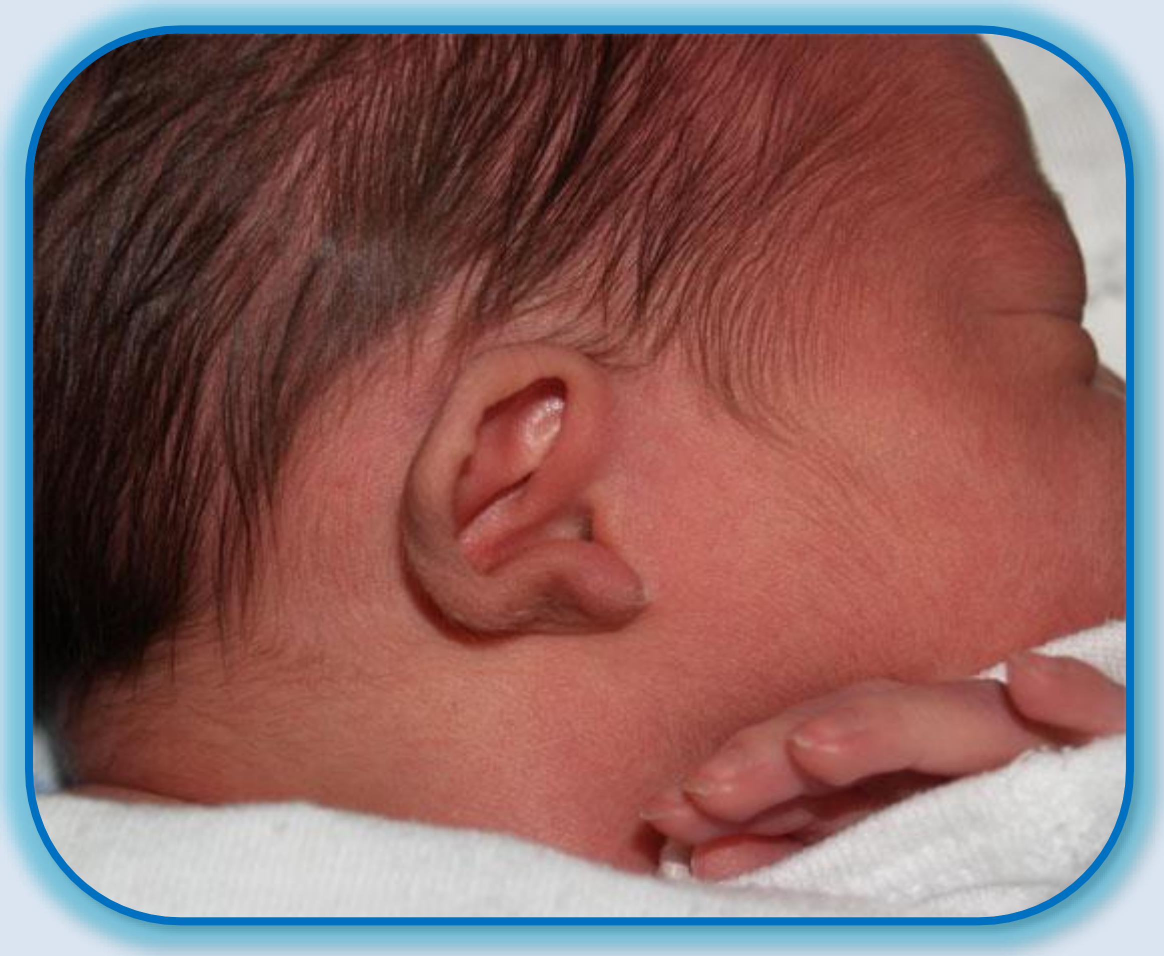
When this deformity is severe enough to be of cosmetic concern, splinting can be done. Exact etiology is unknown.

Lop Ear



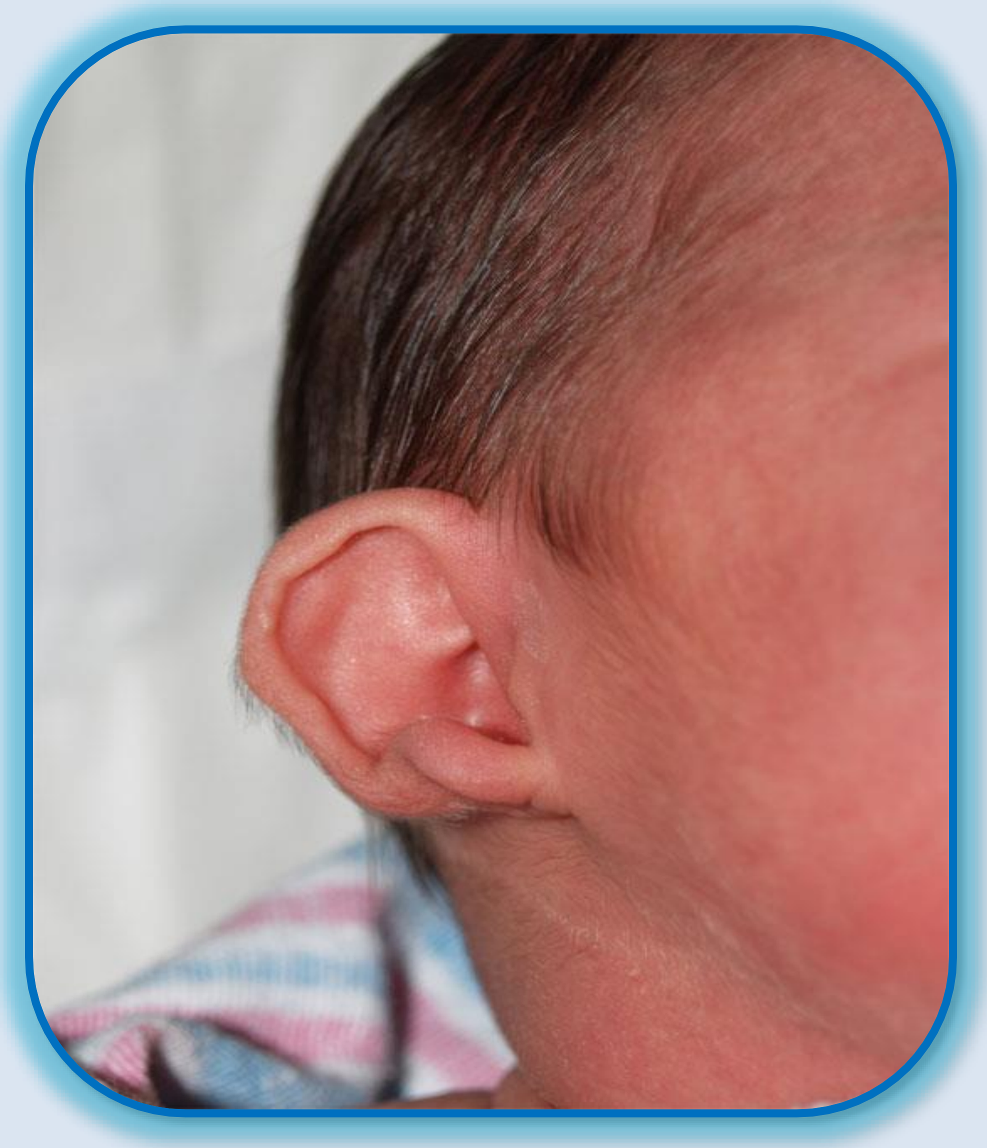
This **pinna deformity**, where the superior edge of the **helix is folded** down, is known as lop ear. Again, it is typically an **isolated** finding. This is another deformity that may be improved with **splinting**.

Cup Ear



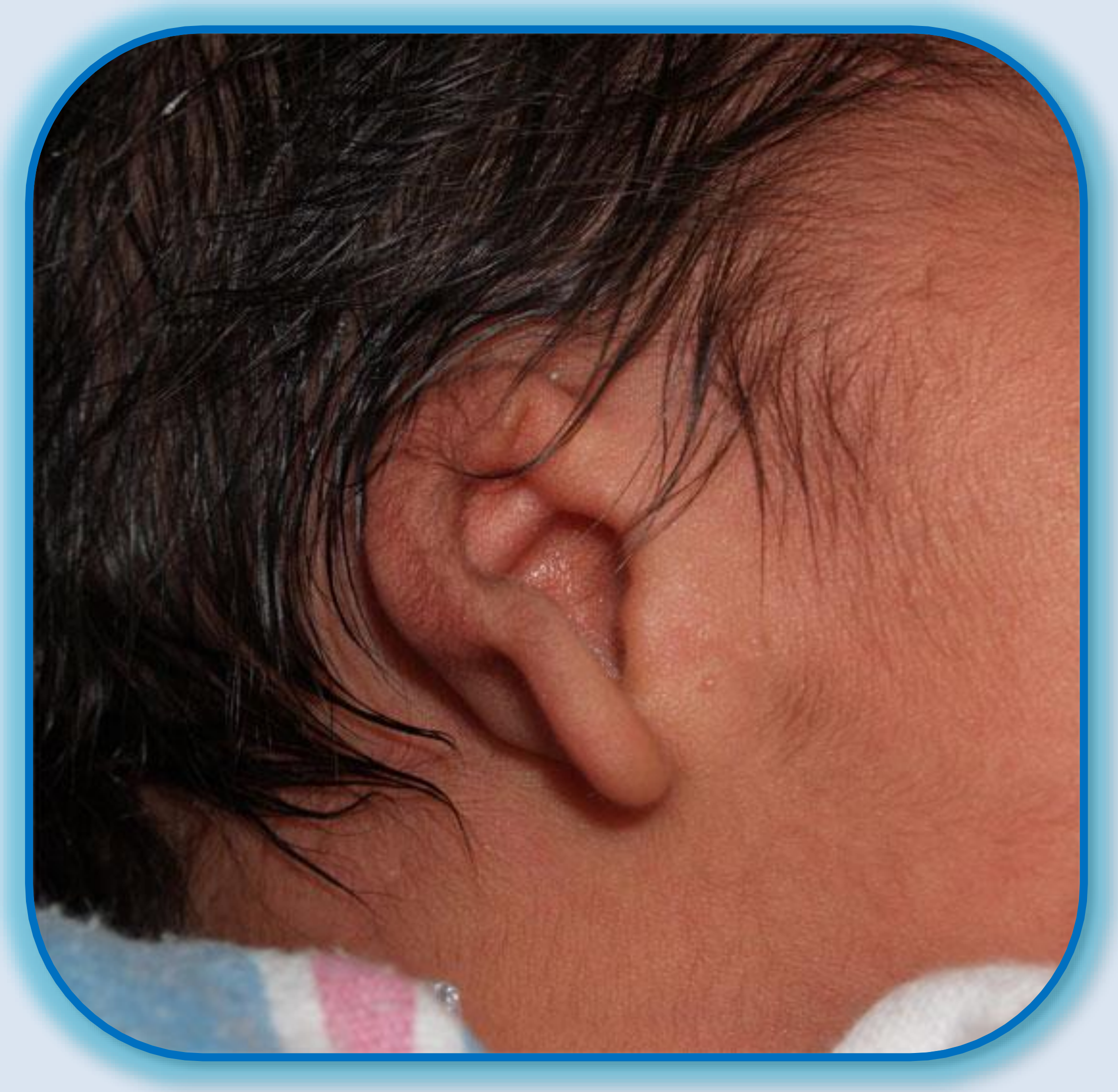
Also known as **"prominent ear"**. In the absence of other abnormalities on physical examination, this finding is only of cosmetic concern. When severe, corrective surgery can be done.

Cup Ear



As an isolated finding, this ear shape does not require any further evaluation.

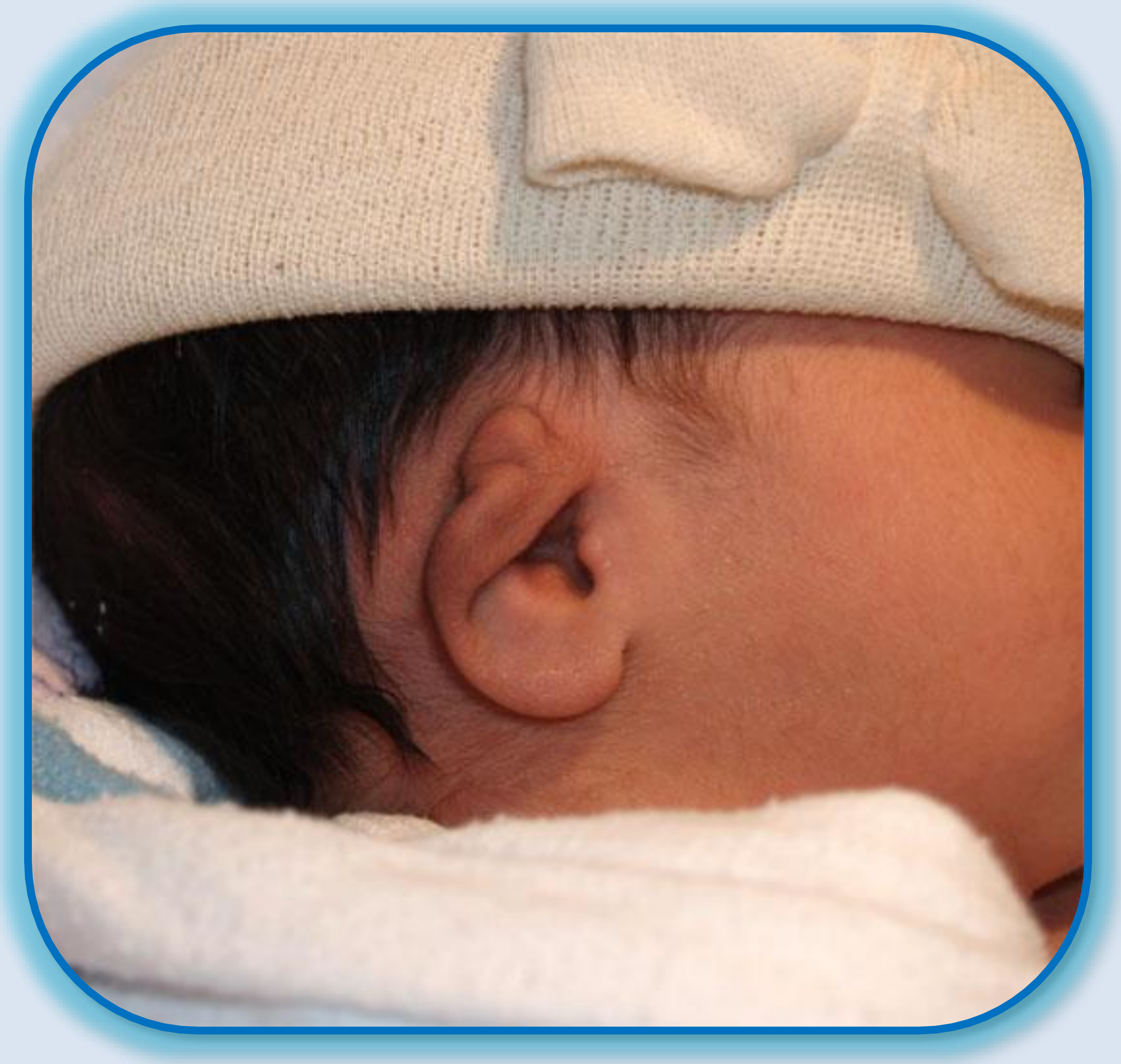
Microtia



In contrast to the previous photos, this pinna is **not well-formed** and is smaller than a normal ear. This is microtia, class II. **Hearing evaluation is mandatory** in these infants.

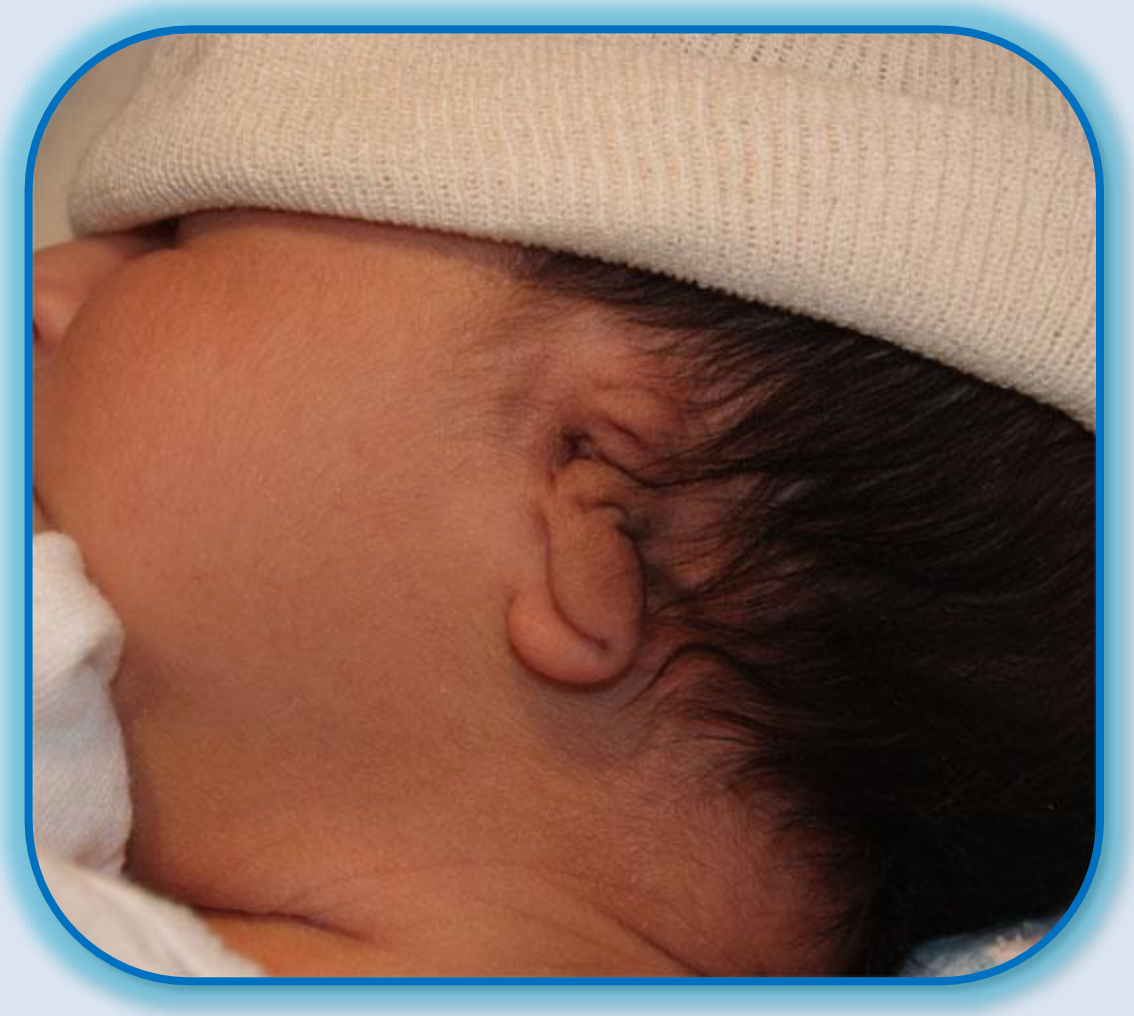
Fortunately, this infant was found to have normal hearing. Elective cosmetic repair was planned.

Microtia



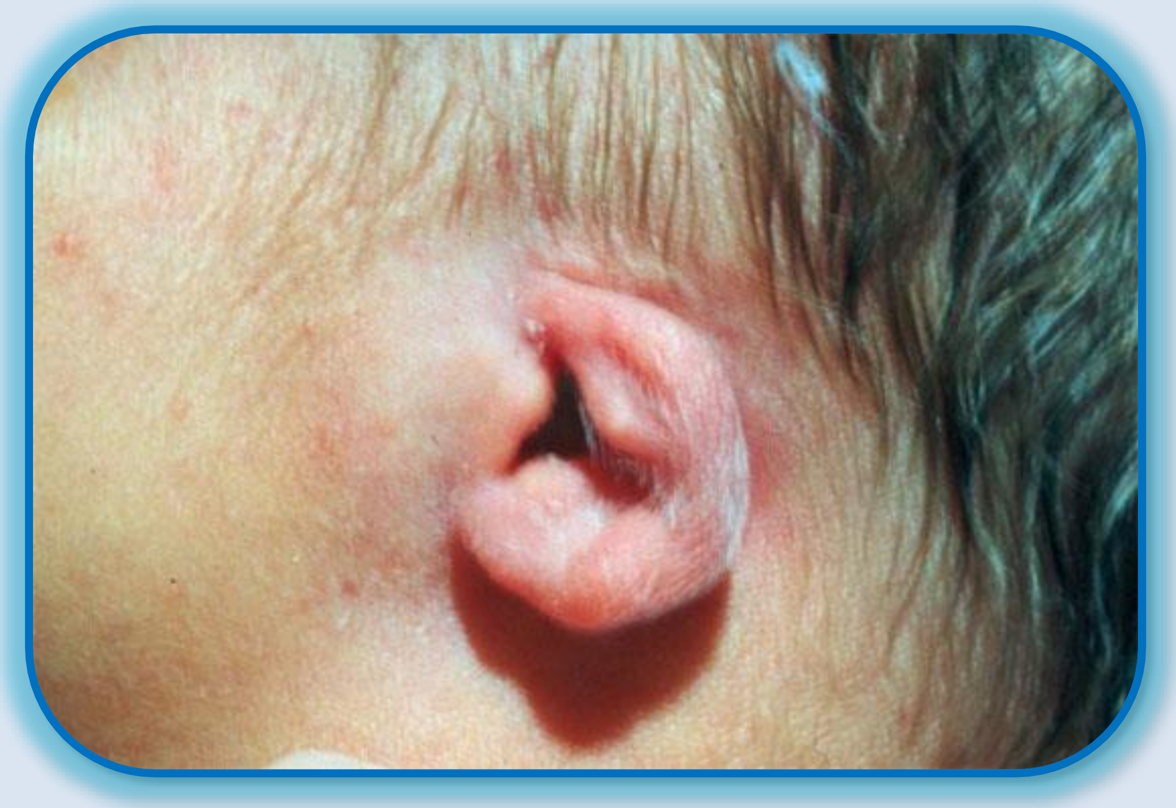
Here is another example of microtia. This infant was also diagnosed with class 2 microtia, which was additionally labeled **"locked ear deformity"**. The internal structures of the ear were normal, and apart from bilateral ear abnormalities, the remainder of the physical examination, and a renal ultrasound, were normal.

Microtia



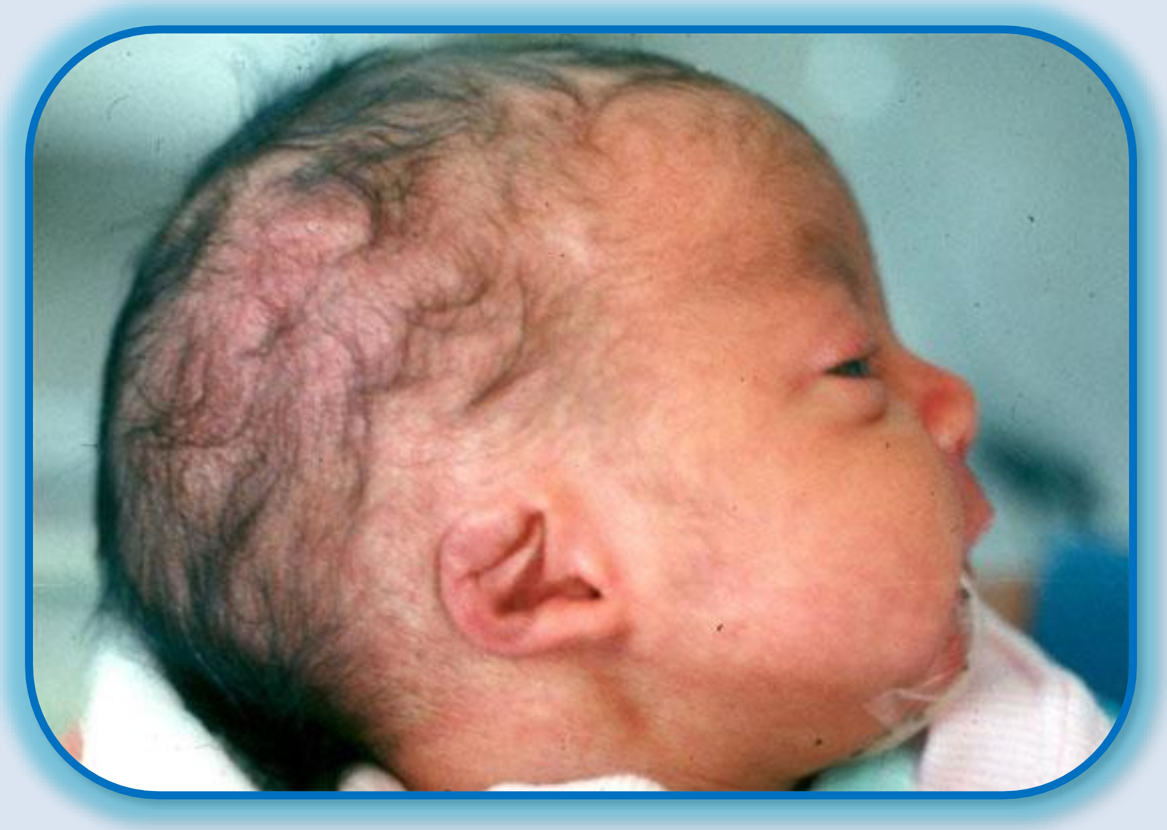
This microtia is **more severe** than the previous examples. This is lobular microtia, class 3, with **atretic ear canal** and the pinna appeared very poorly developed. Approximately **half** of all babies with microtia will have an **underlying congenital syndrome**, so careful assessment for associated abnormalities (in addition to **hearing loss**) should be undertaken.

Hypoplastic Ear



Here is another infant with auricle malformation. The ear is hypoplastic and low set. Again, because **genetic syndromes are frequently associated with abnormal ear shapes**, a careful physical examination should be performed. Even in the absence of other findings, referral to a pediatric ENT specialist may be indicated, as an abnormal pinna may be an indicator of internal ear abnormalities.

Low Set Ear



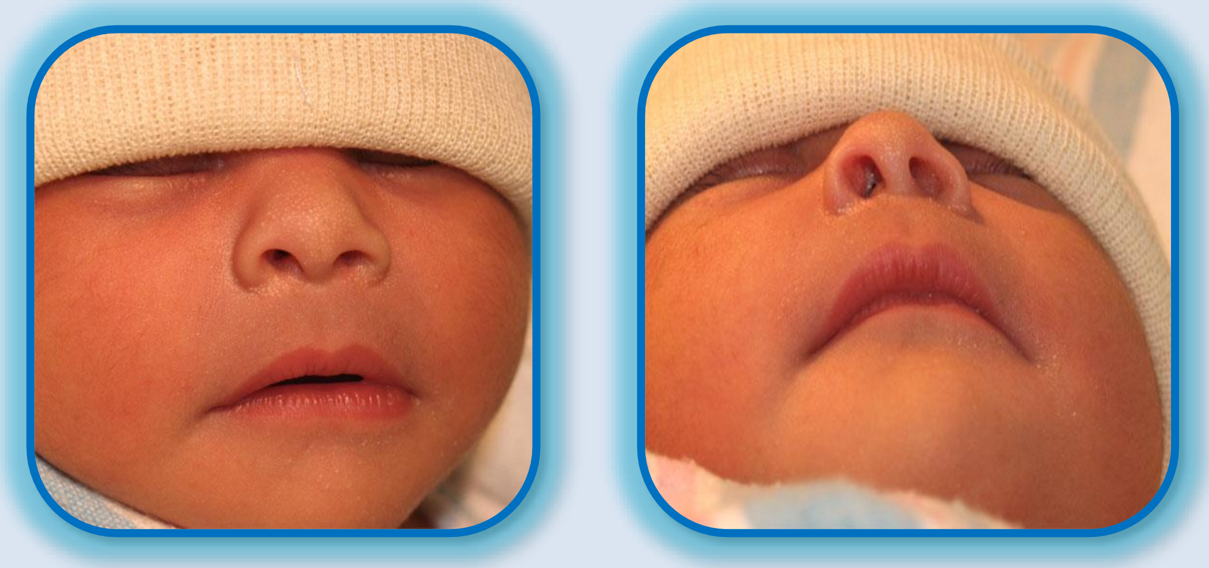
Here, the low set position of the ear (also hypoplastic) can be appreciated.

If an imaginary line is drawn from the outer canthus of the eye straight back to the occiput, a low set ear will fall completely below the line. A normal set ear will cross or touch the same line.

This infant had trisomy 18 as an underlying etiology.

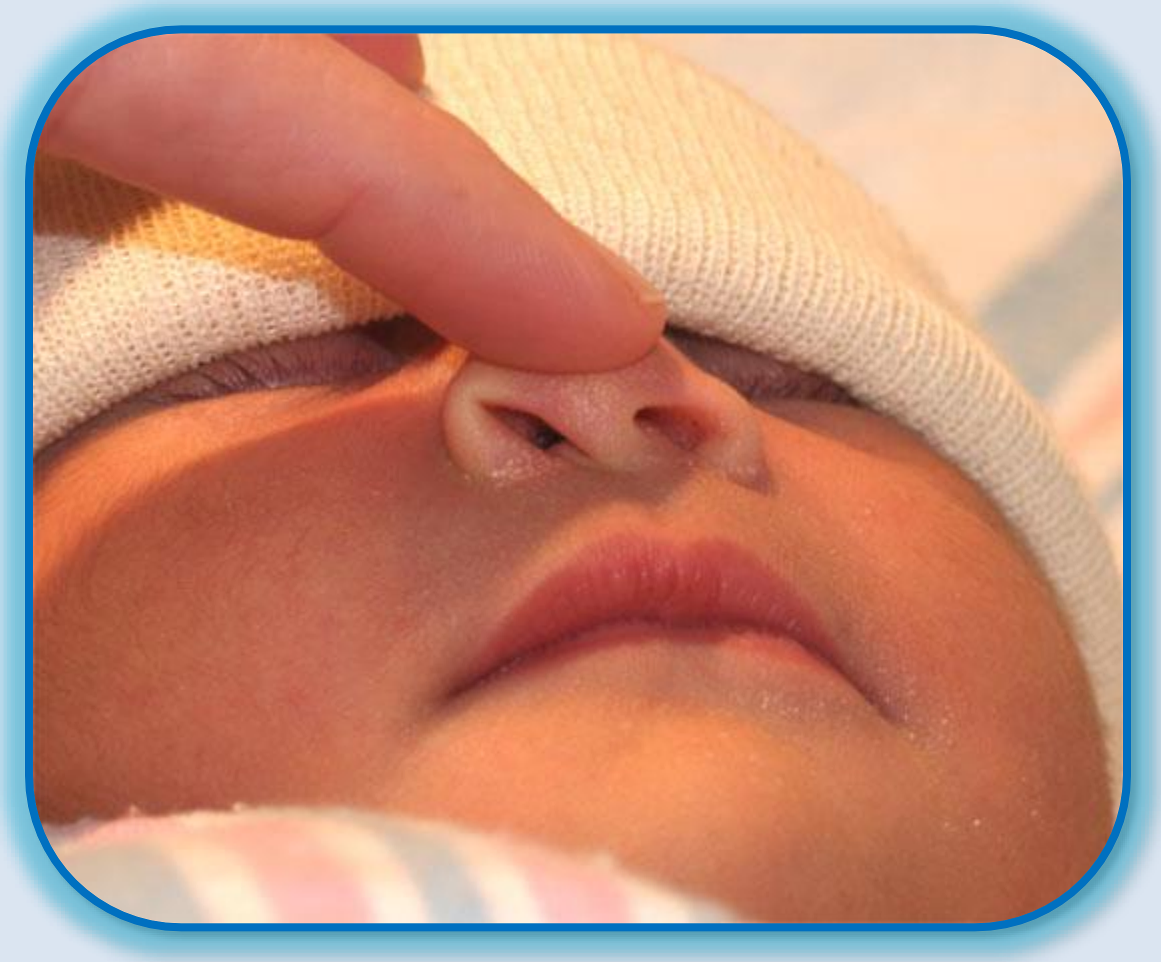
Nose

Positional Nasal Deformity



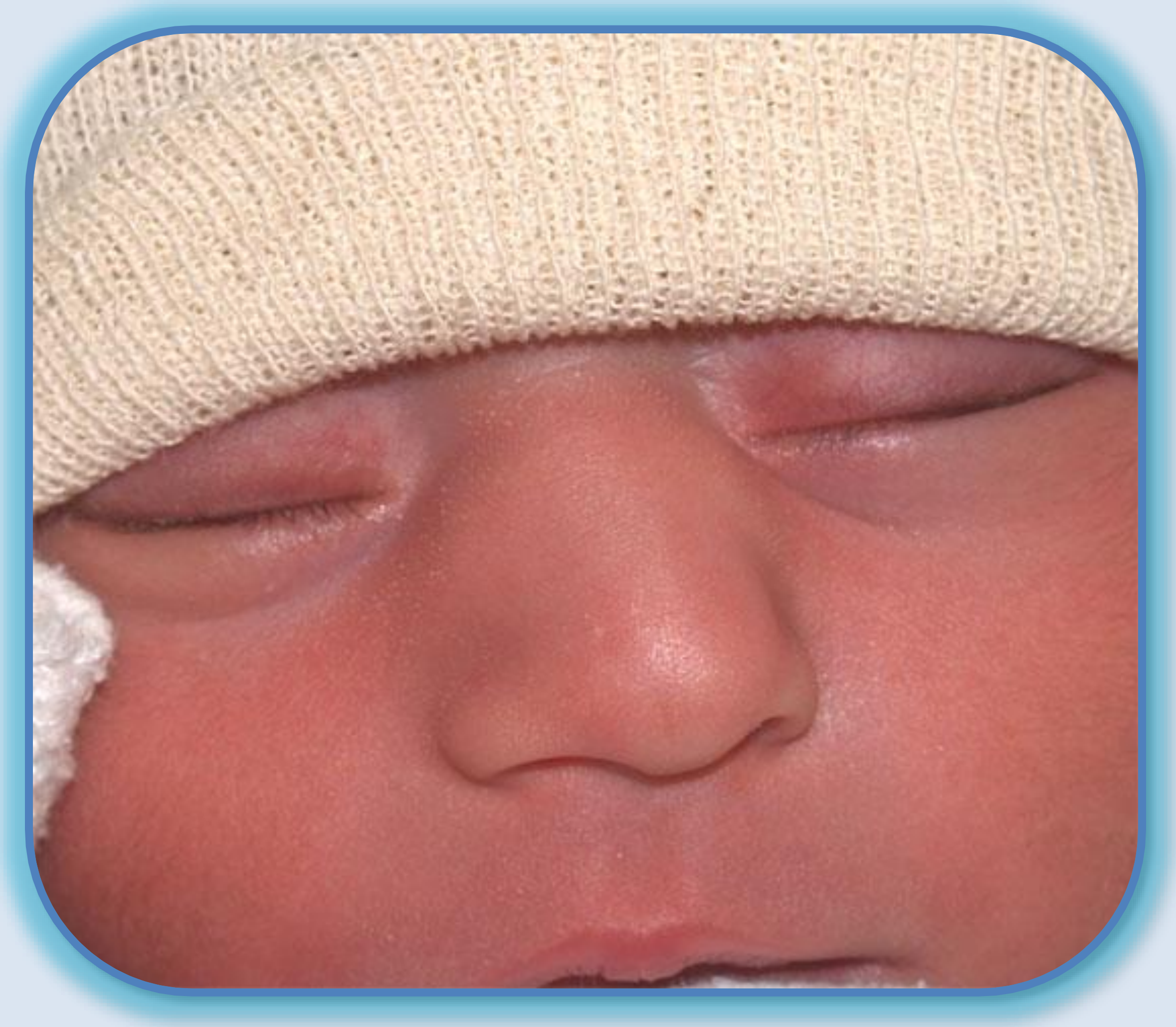
An occasional finding on physical exam is an **asymmetric** appearance of the nose due to a positional deformity. Most likely, this results from an unfortunate **position *in utero***. The nares in this case are asymmetric and slightly flattened towards the infant's right, even though the septum is still centrally located with angulation of the septum.

Positional Nasal Deformity



With compression of the nasal tip, the septum becomes even more angled, raising concern for septal dislocation, but the base is still centrally located.

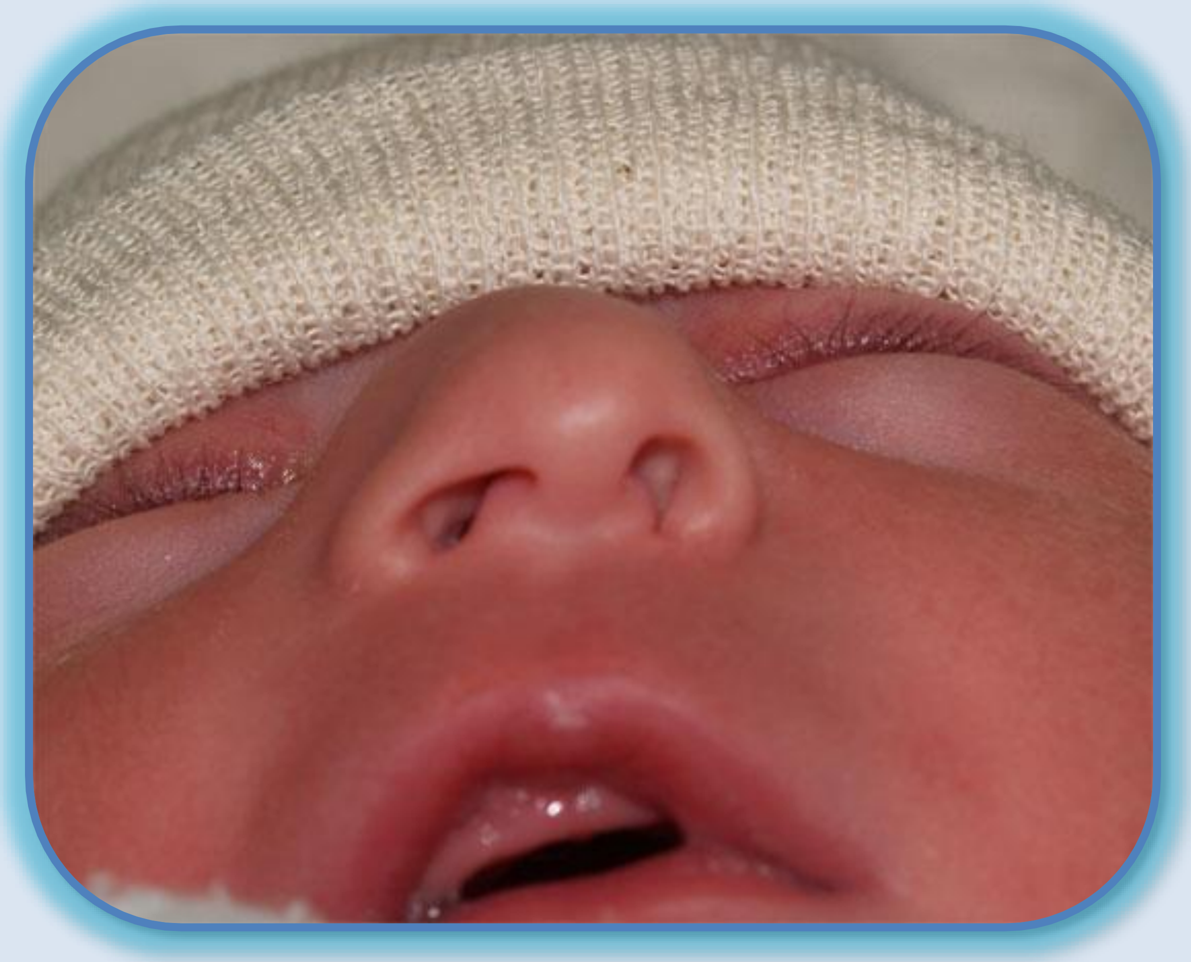
Dislocated Nasal Septum



The vertical axis of the nose deviates to the infant's left. With positional deformity, the nares may look asymmetric, but the nose itself is straight.

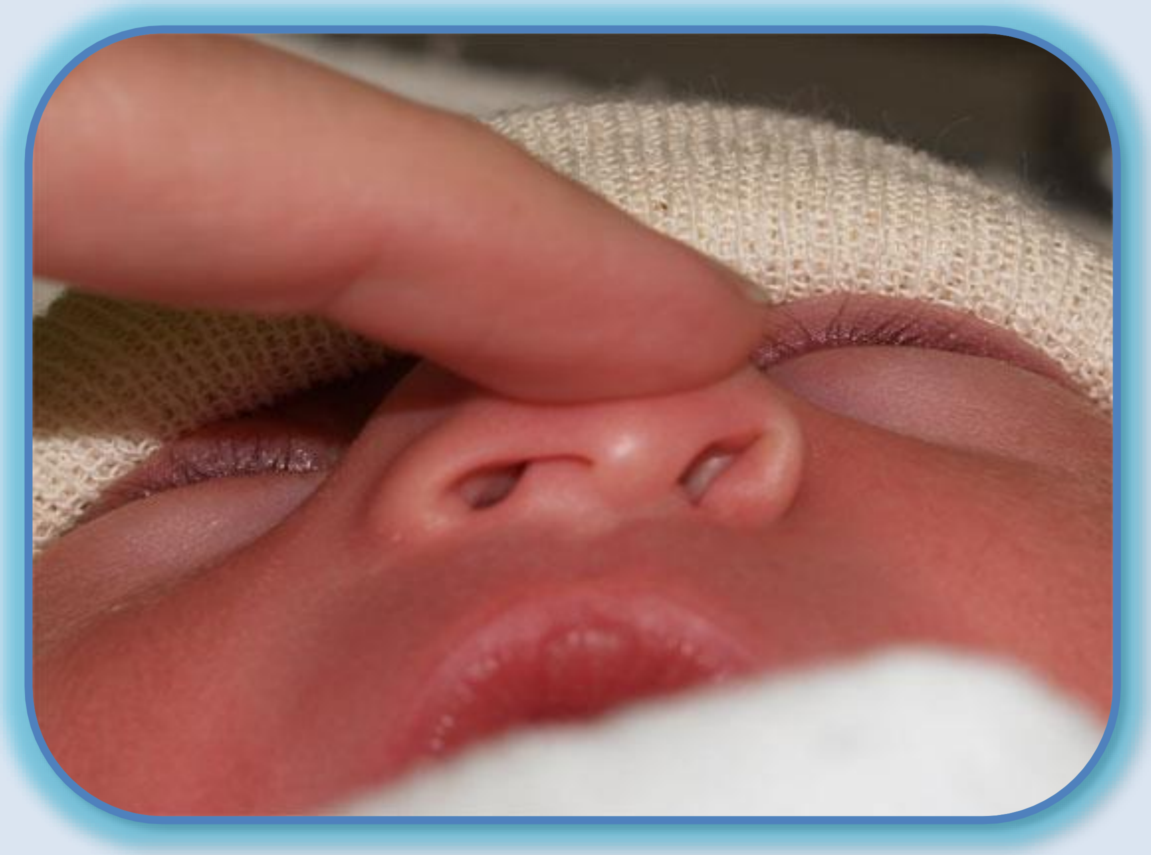
Dislocated nasal septum can result in permanent deformity if not corrected so early referral is mandatory.

Dislocated Nasal Septum



From this view, the deformity is more easily seen. The septum is not straight and the whole bottom segment of the nose appears to be shifted to the baby's left.

Dislocated Nasal Septum



When the tip of the nose is compressed gently in the presence of a dislocated septum, the deformity appears to worsen. In this photo, the tip of the nose is actually beside the base of the septum.

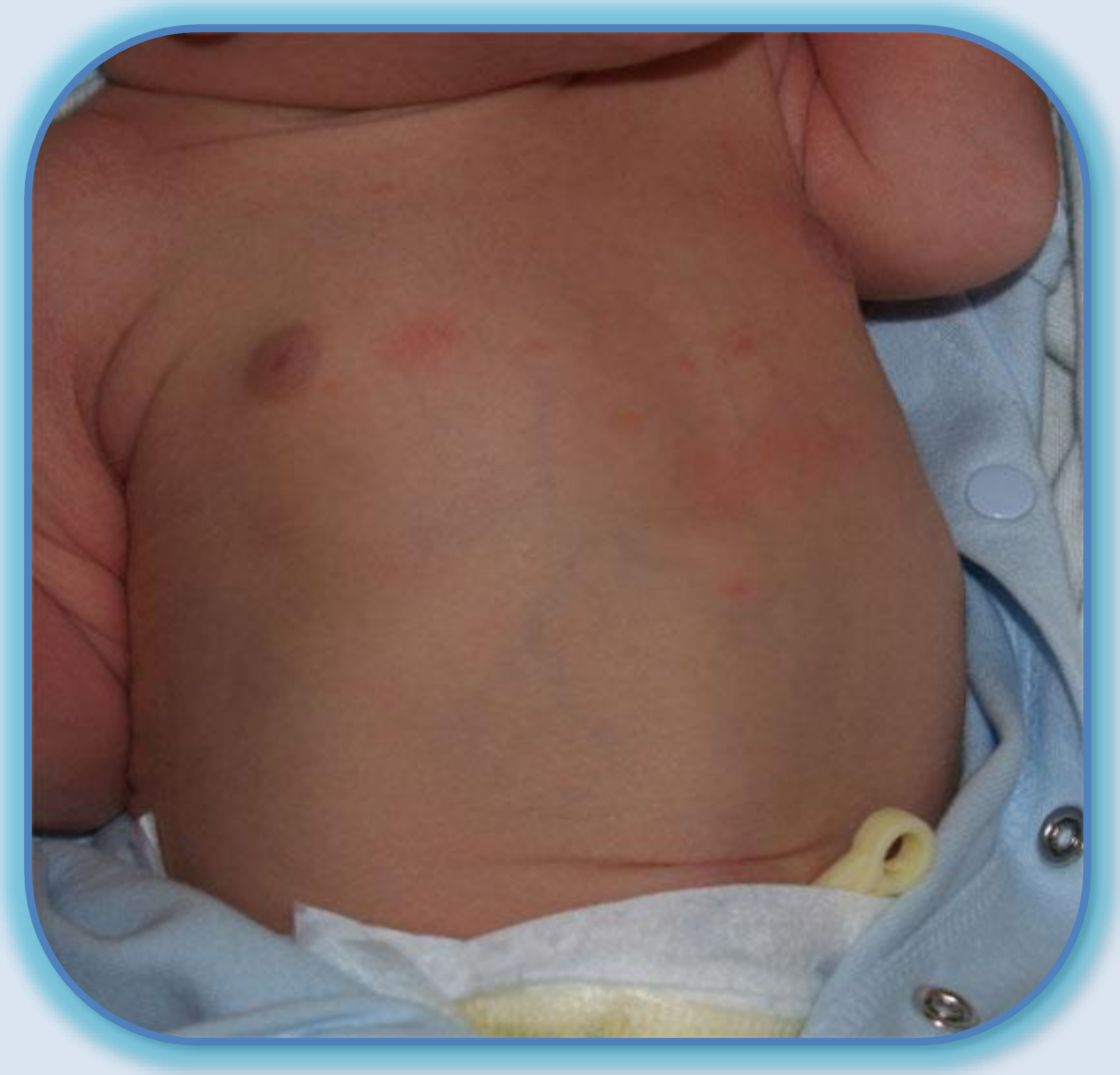
With positional deformity, the septum would stay straight, even if the nares appear uneven.

Incidence of dislocated septum is about 4%.

An experienced pediatric otolaryngologist can relocate the septum easily, without surgery, if consulted early (within the first few days of life), so recognition of this condition and timely referral is important to prevent permanent deformity.

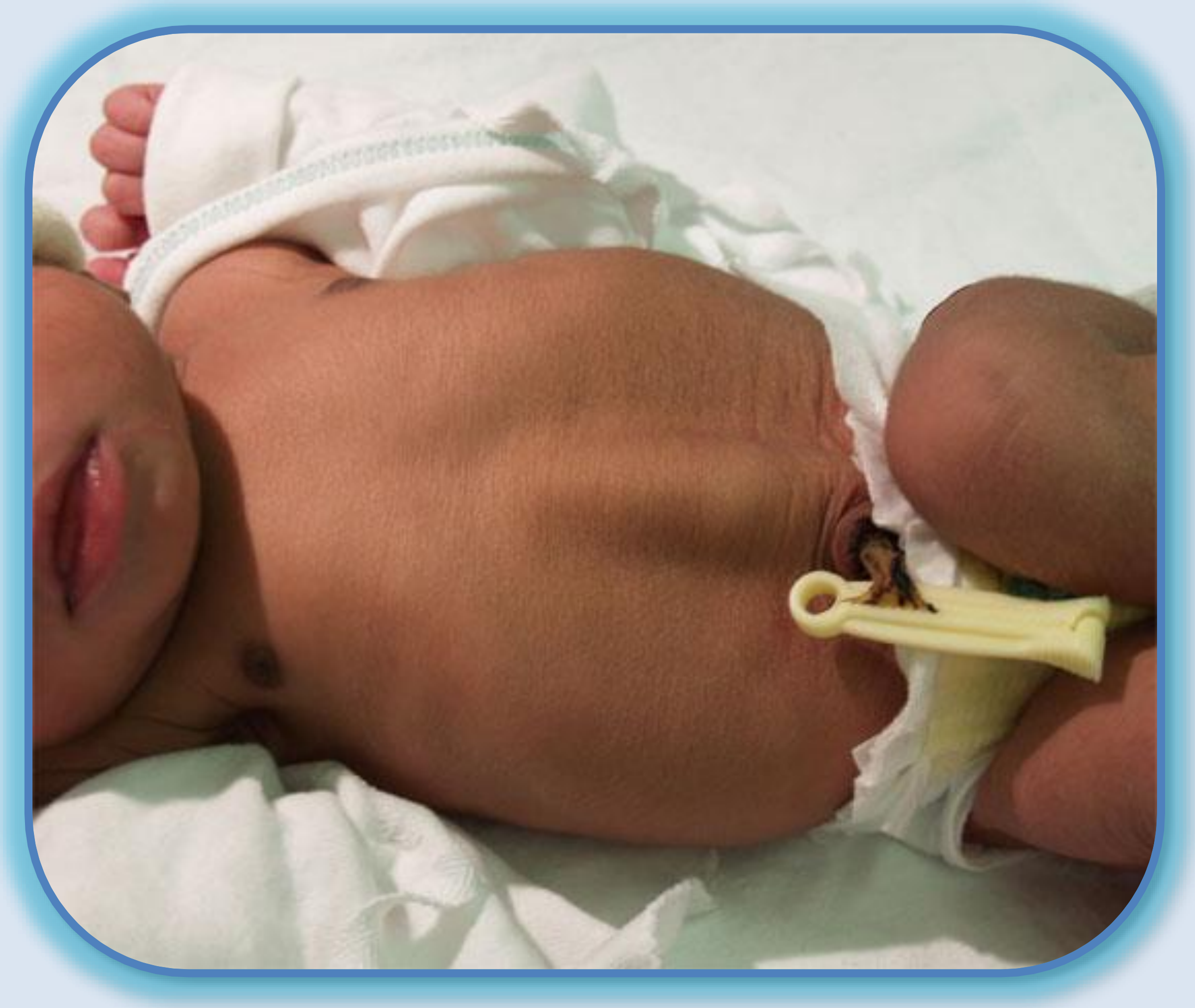
Abdomen

Diasatsis Recti



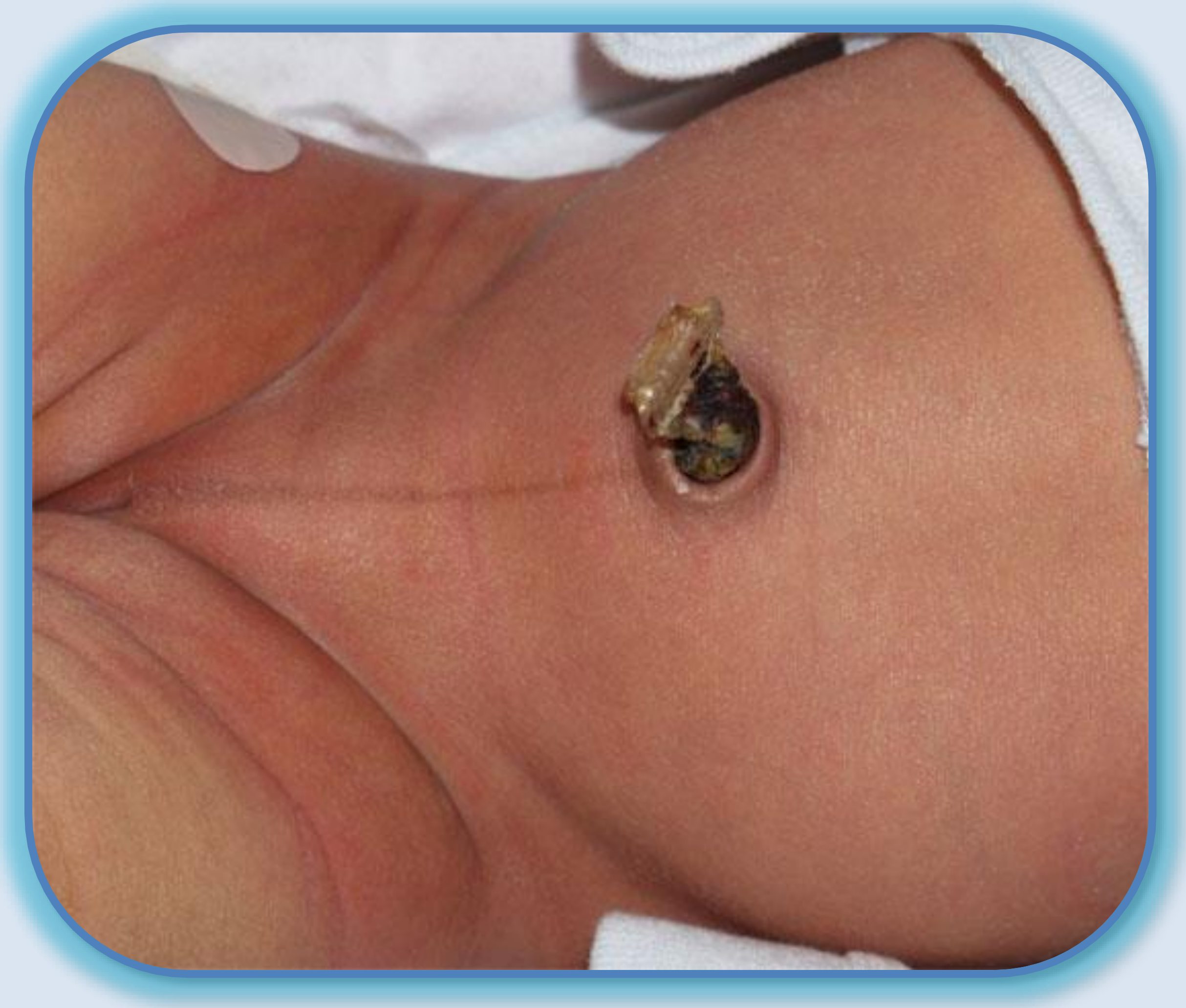
A **vertical bulge** down the **midline** of the abdomen can be seen in many newborns when intra-abdominal pressure increases. Diastasis recti is caused by a relative **weakness** of the **fascia** between the two rectus abdominus muscles. It is **not** a herniation and is not pathologic. With time, this will disappear.

Diasatsis Recti



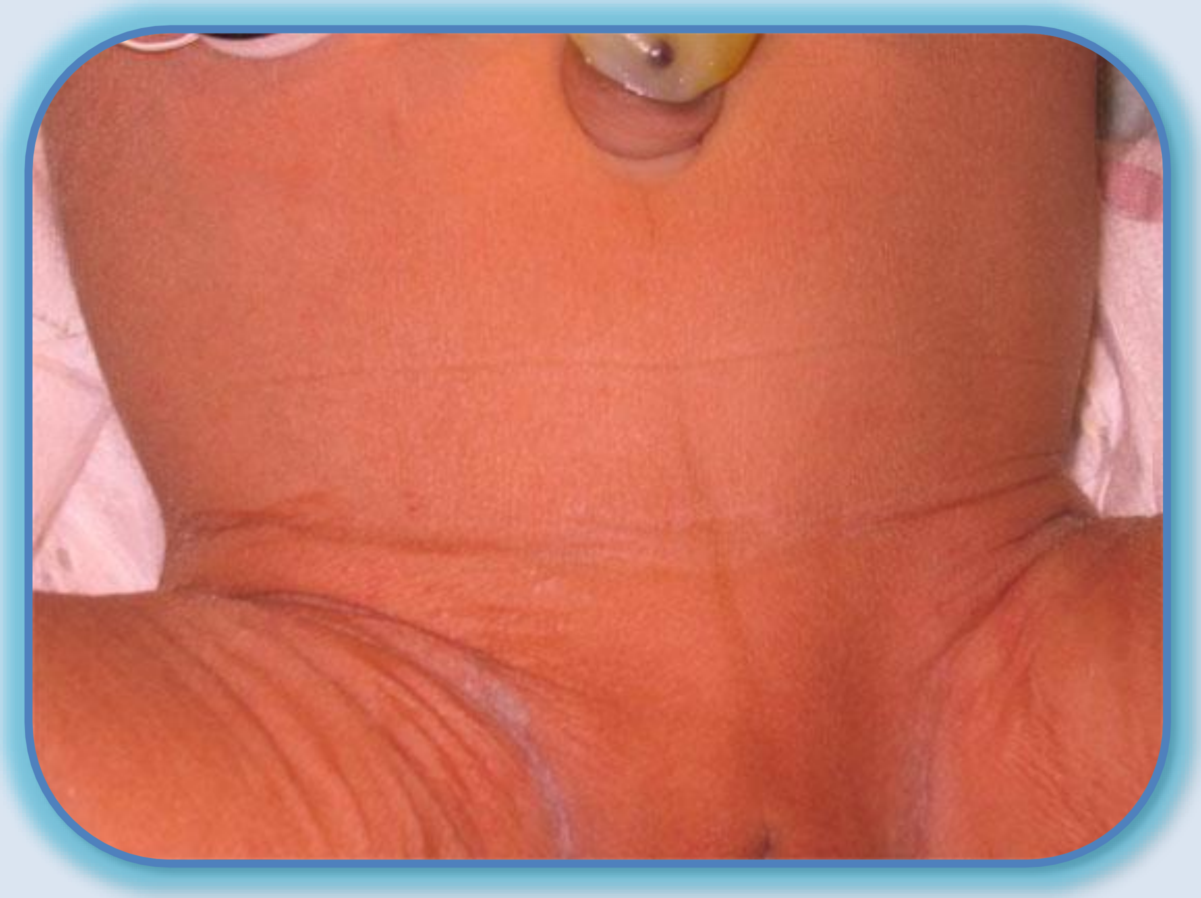
Another newborn has more pronounced diastasis recti. Spontaneous resolution is still expected.

Linea Nigra



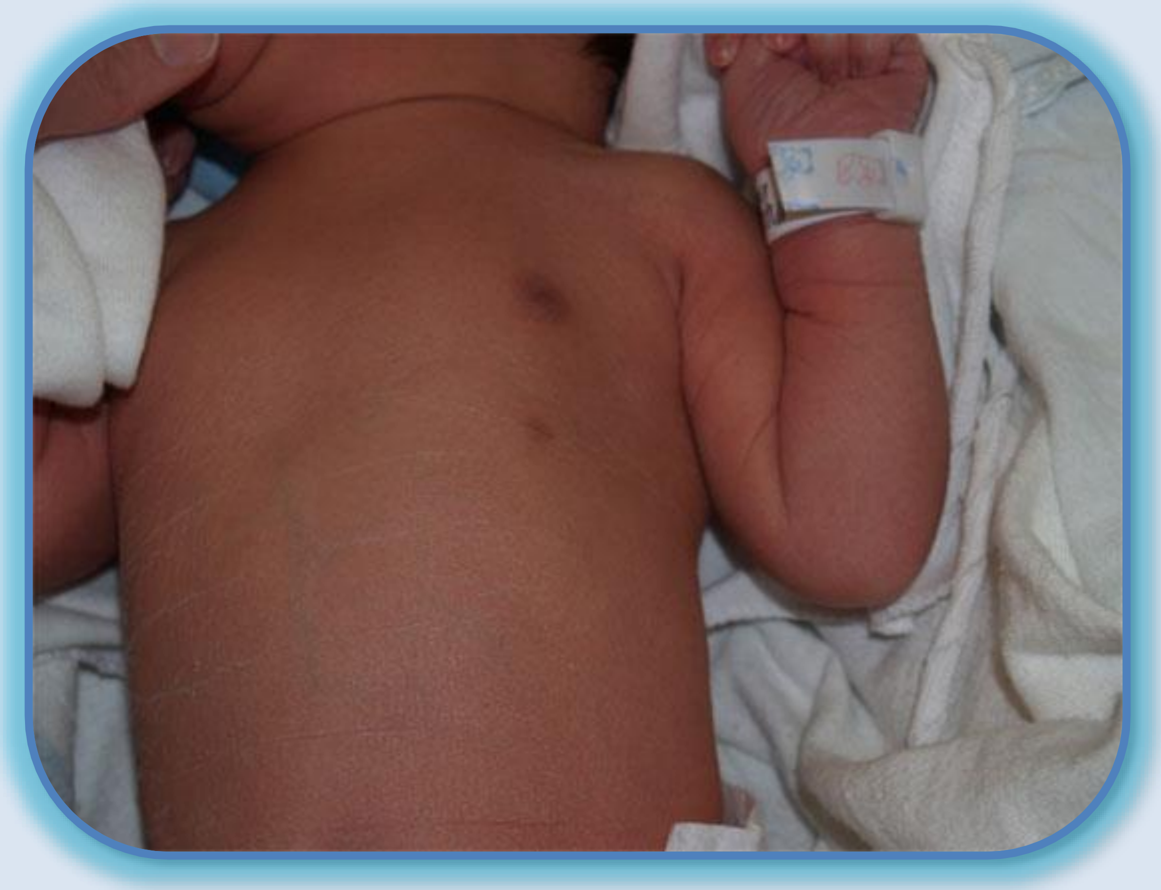
The **dark line** down the **midline** in this baby is a linea nigra. It is a fairly **common** finding in newborns, especially those with more pigmented skin. The presence of linea nigra seems to be impacted by hormonal levels, as this finding is often seen is pregnant women as well. It is completely **benign**.

Linea Nigra



Here is another example of linea nigra. The line is more faint, but the appearance of a midline stripe between the umbilicus and the pubis is diagnostic.

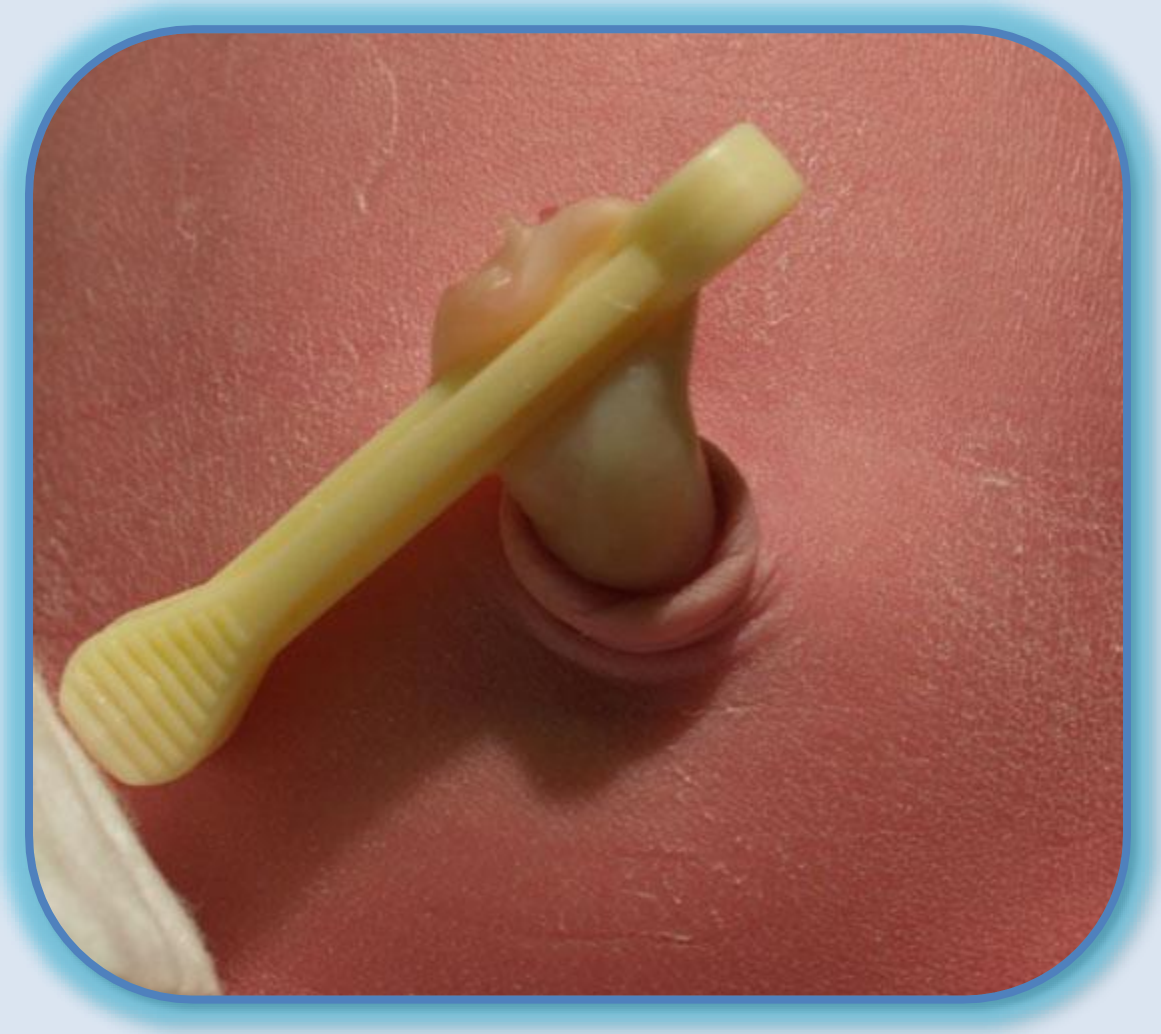
Supernumerary Nipple



The brown macule below the left nipple in this infant is a supernumerary nipple. Found along the **"milk lines"** they may be **single or multiple**, **unilateral or bilateral**. It is an **insignificant** finding.

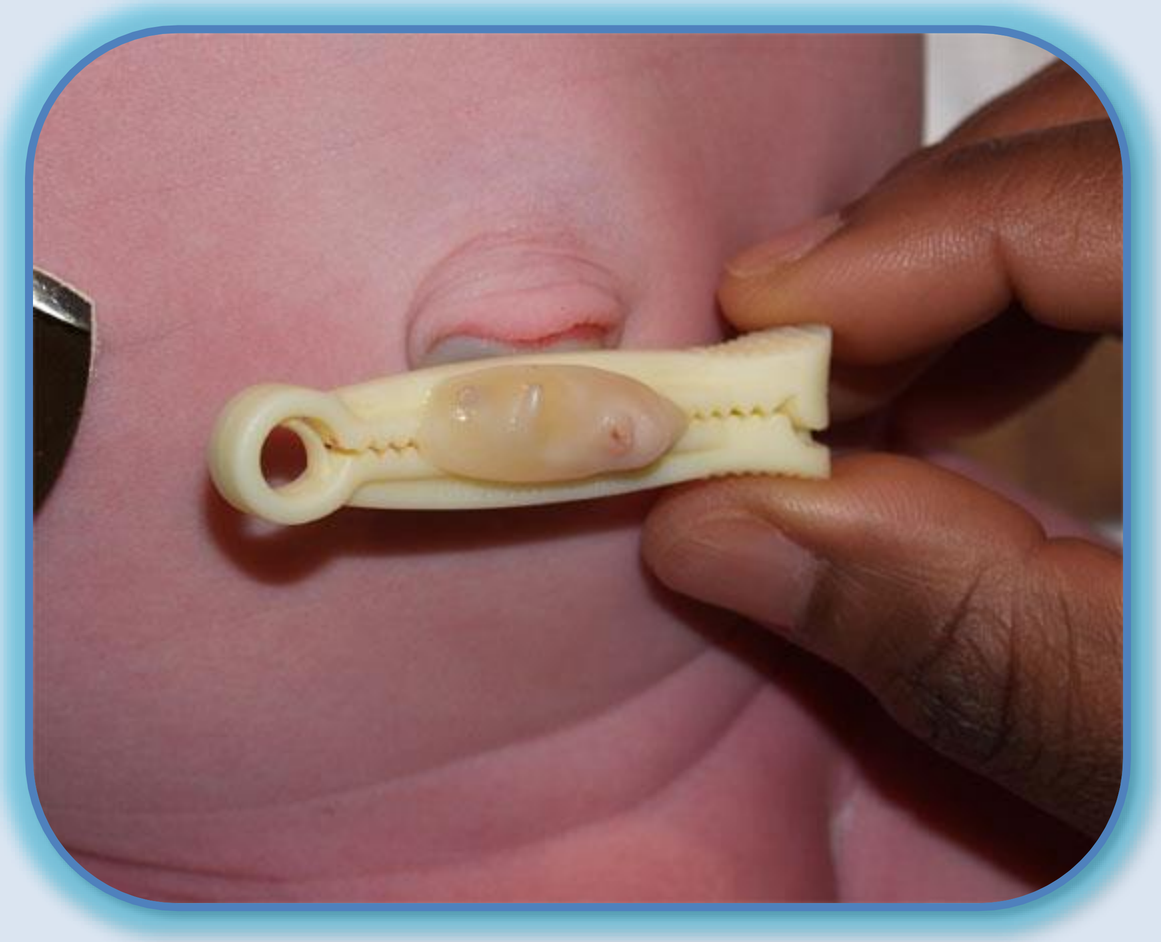
Umbilical cord

Normal Umbilical Cord



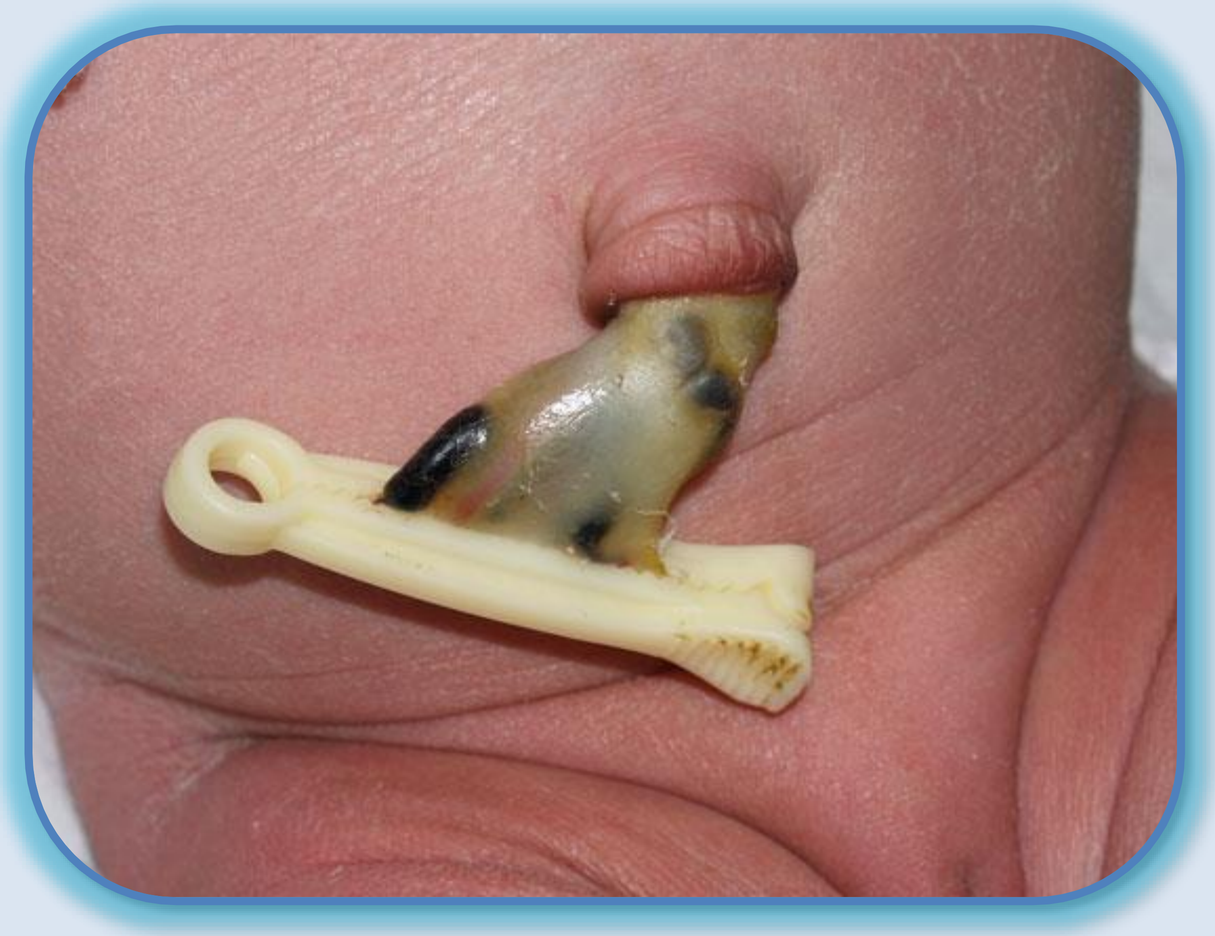
This infant is 7 hours old. The cord is plump and pale yellow in appearance. A normal cord has **two arteries** (**small**, round vessels with thick walls) and **one vein** (a **wide**, thin-walled vessel that usually looks flat after clamping).

Normal Umbilical Cord



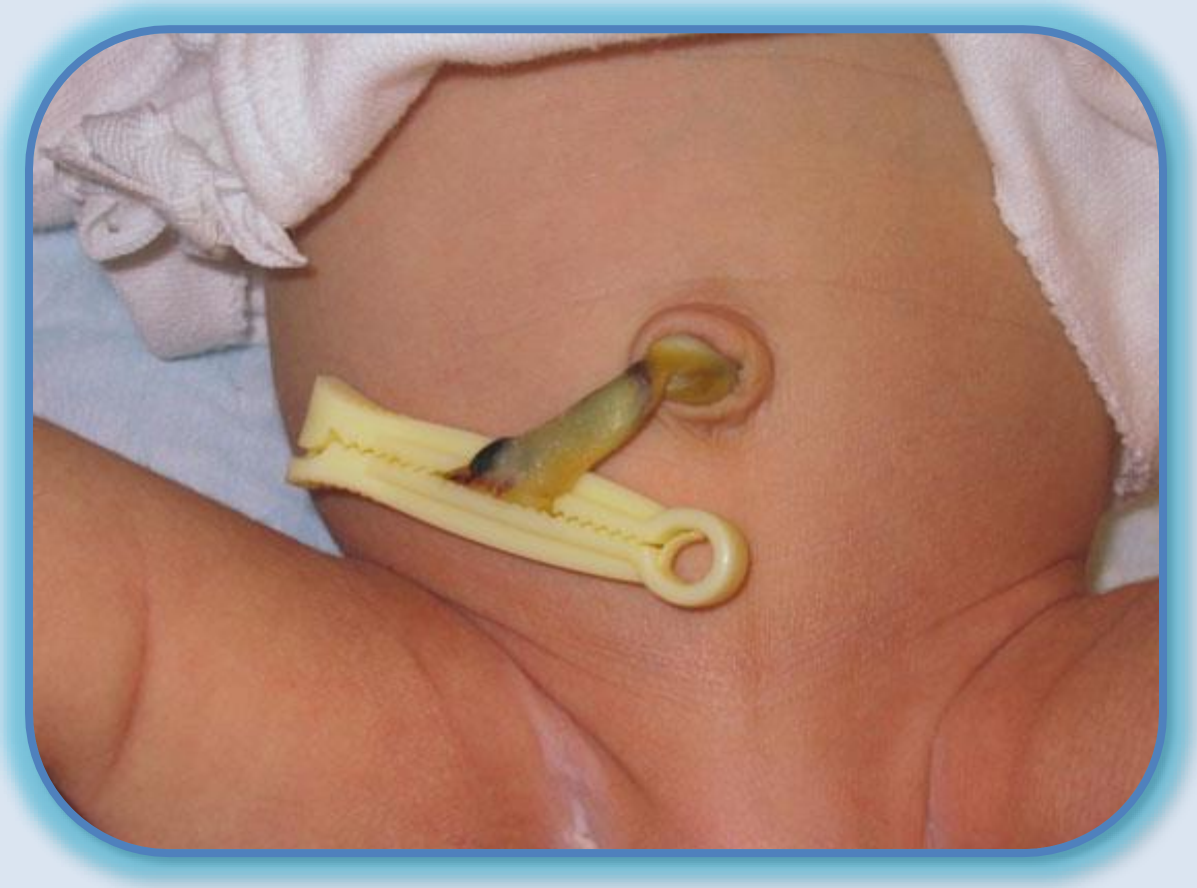
Looking at the cut edge more clearly shows the **normal vessels** of the umbilical cord. The two arteries are to the left and the vein, with a spot of blood in its large lumen, is on the right.

Normal Umbilical Cord



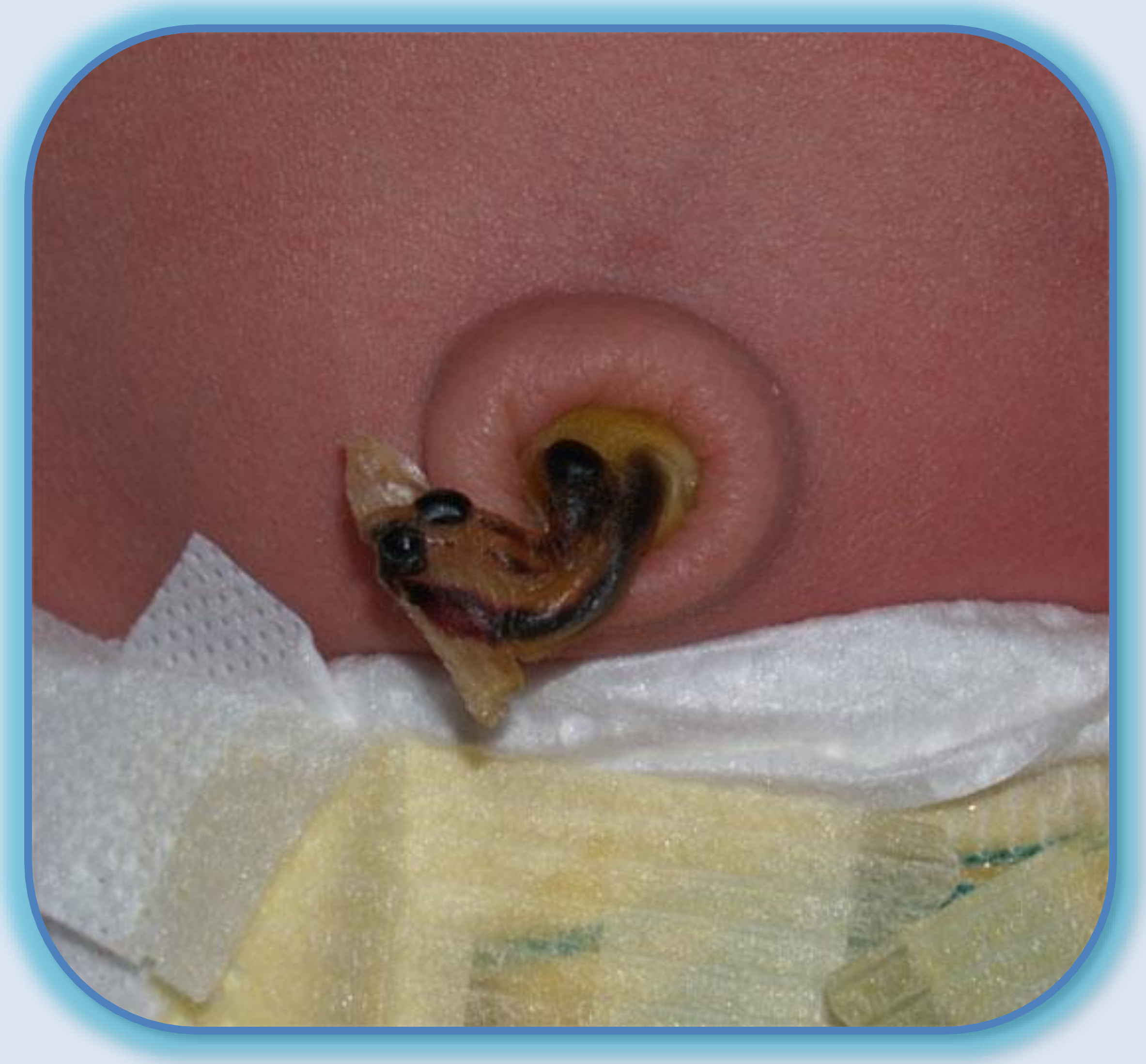
The **dark stripes** within the cord in this picture are examples of intravascular **clots** (a normal finding in newborns). In some cases, the vessels are so full of clotted blood that all three may be clearly identified as they wind around through the umbilical stump.

Normal Umbilical Cord



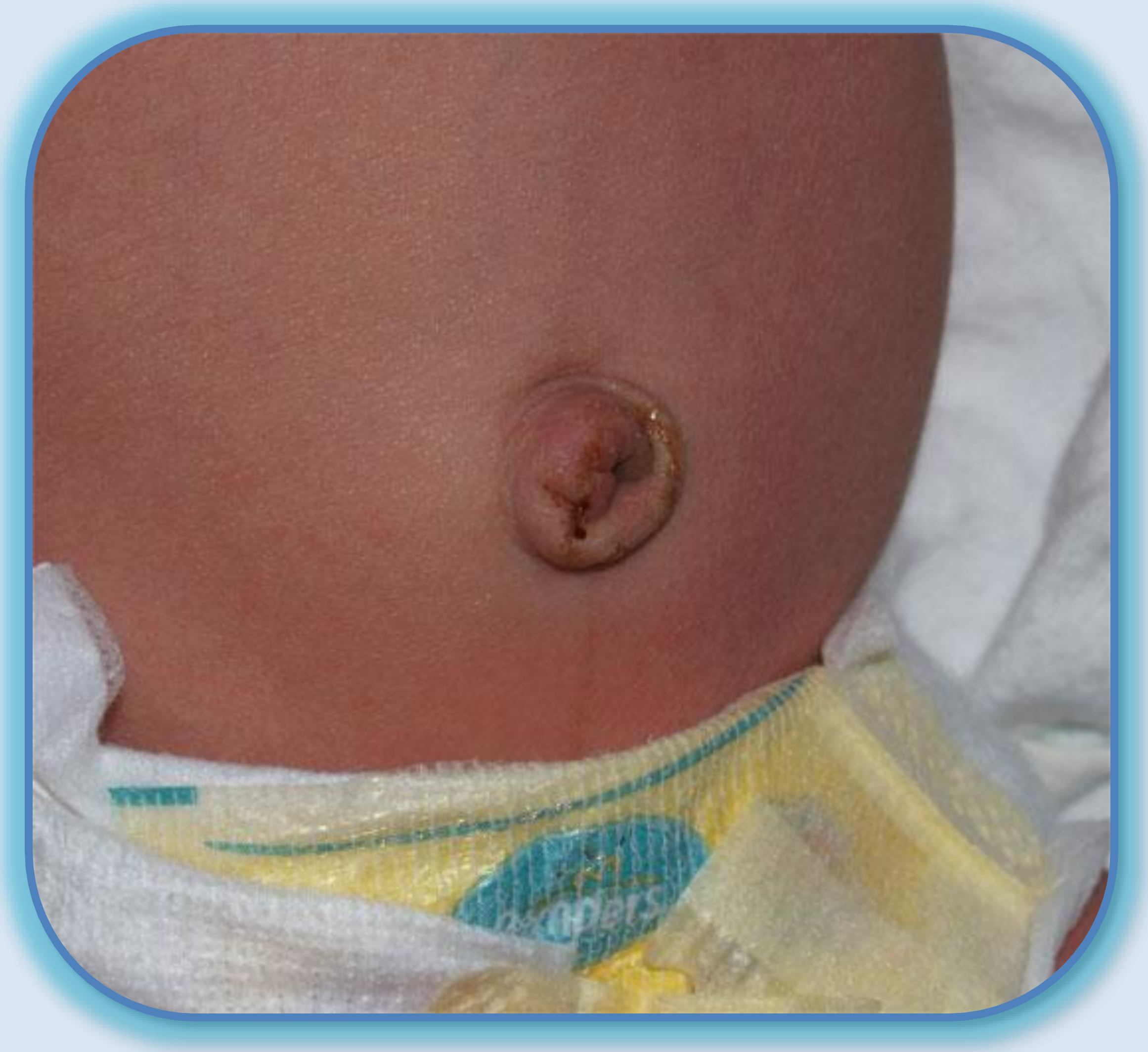
This infant is 19 hours old. The cord is **beginning to dry and darken** as it makes its transition into a non-functioning organ.

Normal Umbilical Cord



After a couple of days, the cord is a **stiff, dry stump**. The **bulge of skin** around the edge is a **normal** variant and does not represent an abnormality.

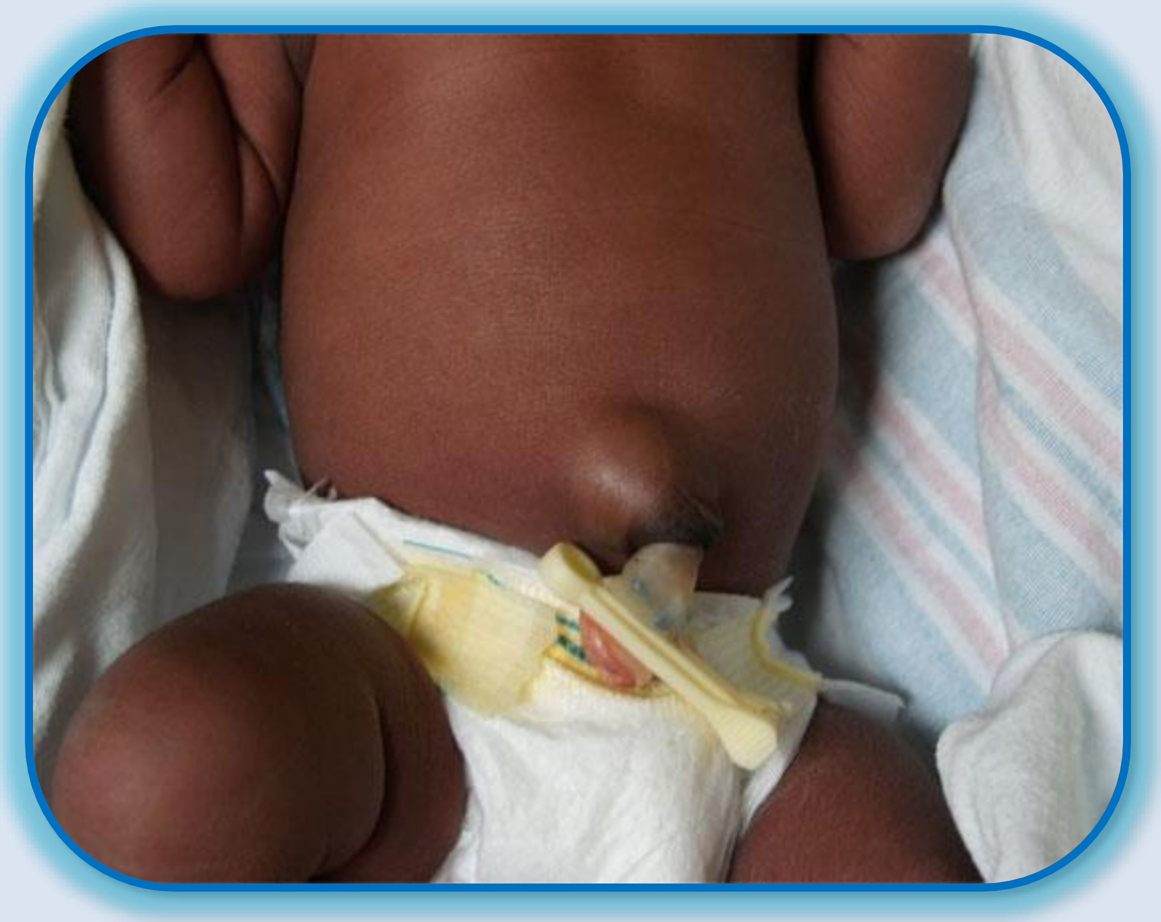
Normal Umbilical Cord



Just minutes after the cord falls off, **A spot of blood or a slight amount of moist, yellow material may be present on the diaper or clothing after cord separation**.

Any bleeding or discharge that **persists** should be evaluated, as this is **not** a normal finding.

Umbilical hernia

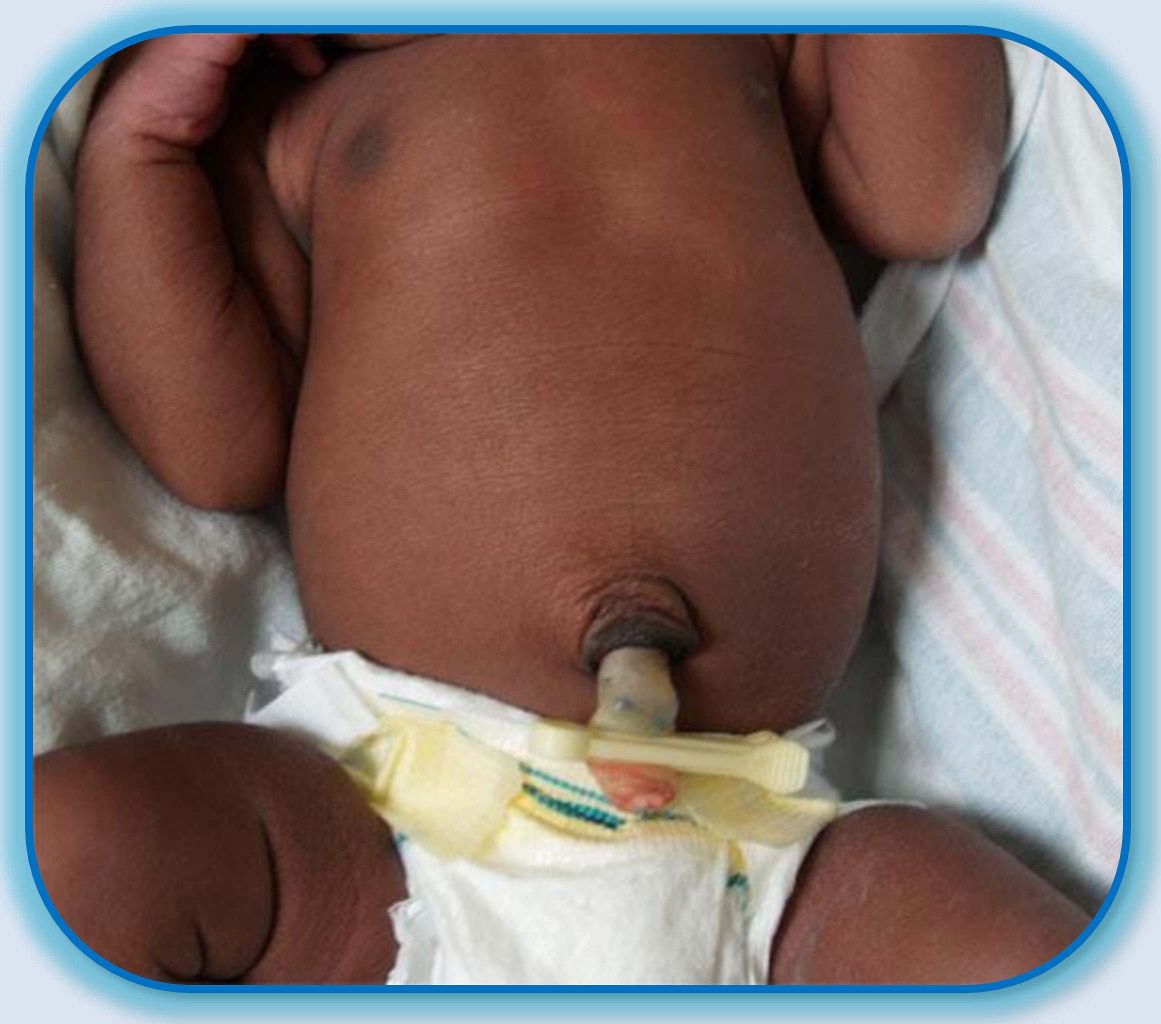


When the umbilical ring is weak or large, an umbilical hernia can result (with increased abdominal pressure).

This does not require treatment, as **most hernias of this type resolve spontaneously** during the first year of life.

Complications, such as strangulation of bowel, are **extremely rare**. Surgical correction is only considered for those who have large defects that are still open after one year of age.

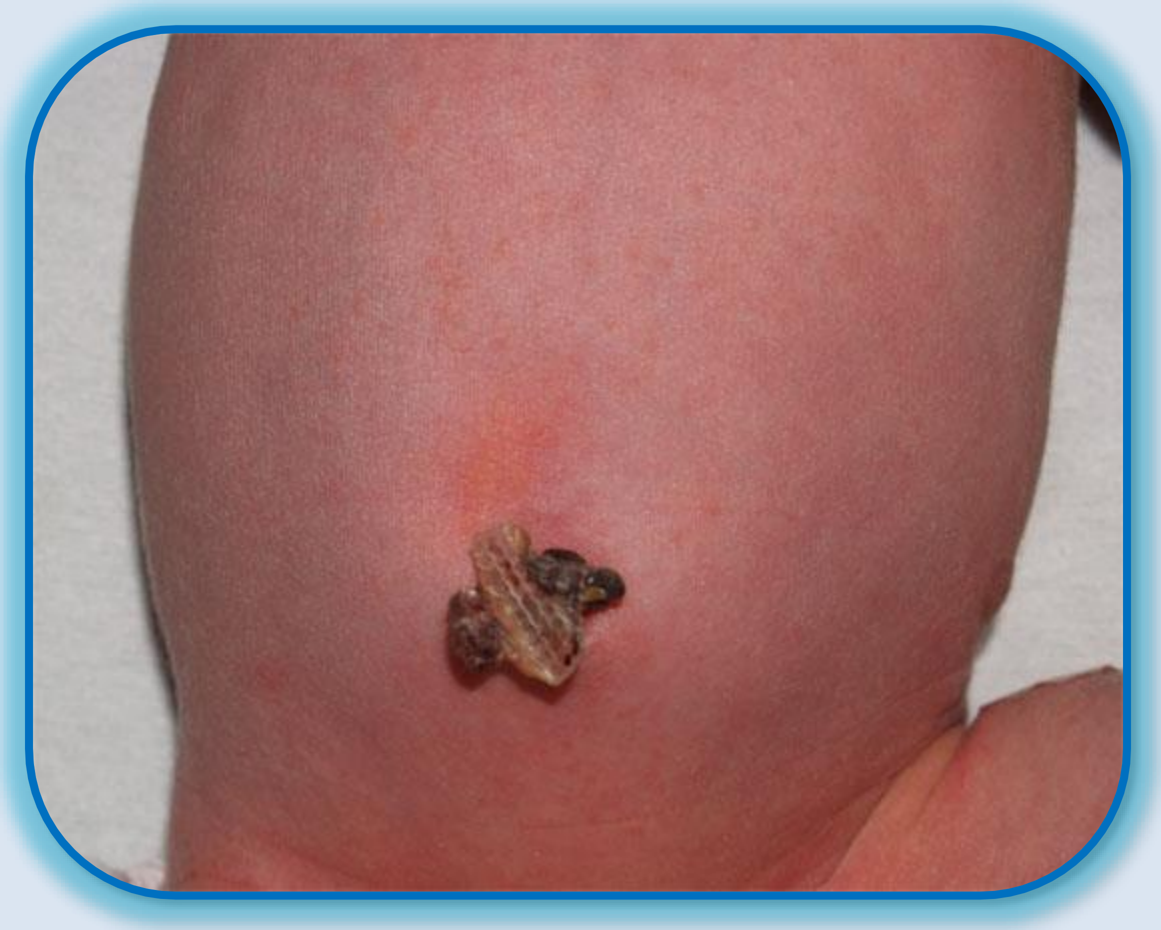
Umbilical hernia



The infant is now quiet, and intra-abdominal pressure low, so the hernia is no longer visible (with slight digital pressure).

Parents are often concerned about the degree of elevation of the bulge, but the **severity of the hernia is determined solely by the size of the umbilical ring**. The visibility of the bulge is related to intra-abdominal pressure and is therefore constantly changing.

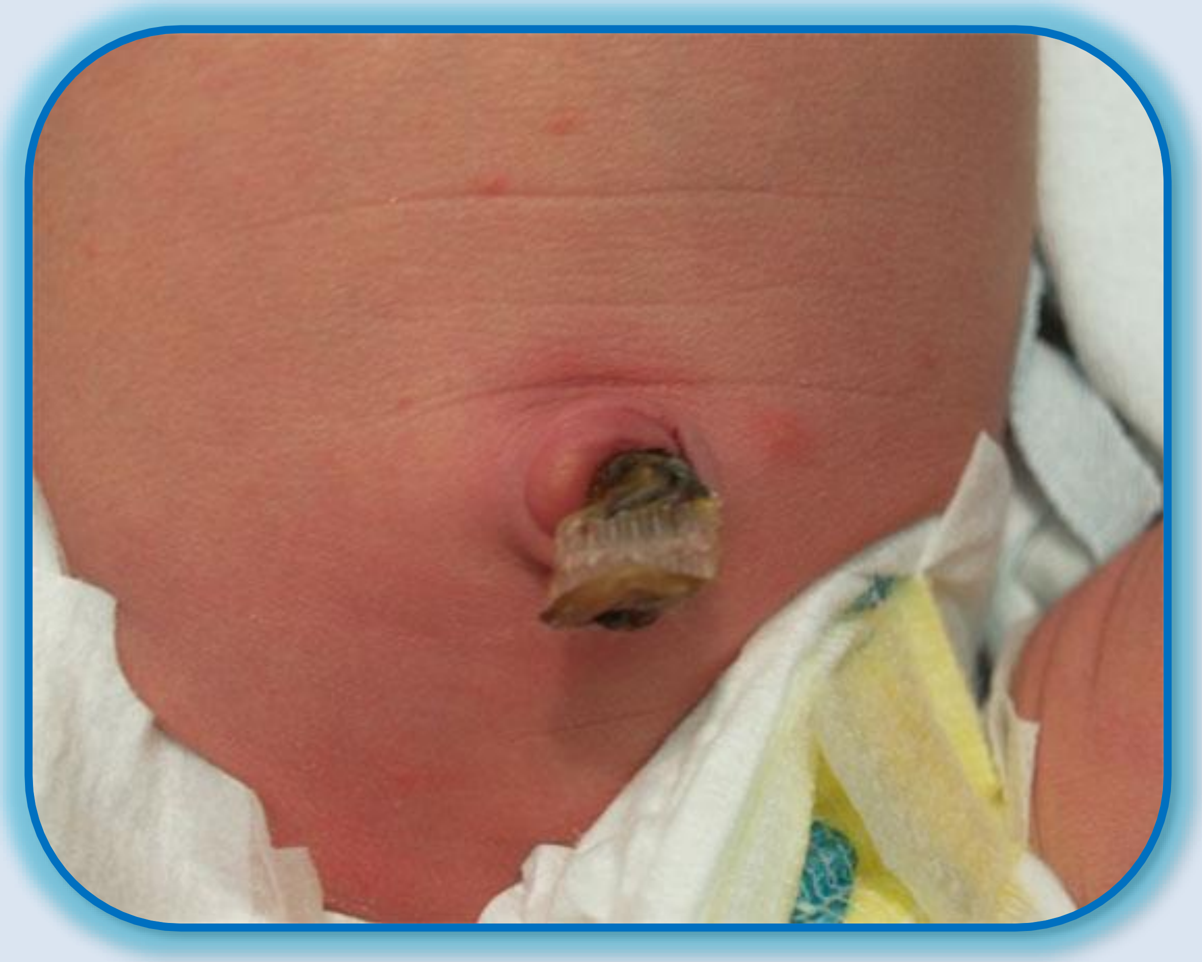
Irritation from the hard, dry umbilical stump



The **redness** superior to the umbilical cord is simply **irritation** from the hard, dry umbilical stump rubbing against the abdomen.

Because omphalitis (an infection of the cord itself) is a dangerous condition, redness in this area should be carefully evaluated. However, the **localized** nature of the redness here, along with the fact that it is somewhat **away from** the actual insertion of the cord and appears very **superficial** is reassuring that infection is not the underlying etiology.

Erythema around the drying cord

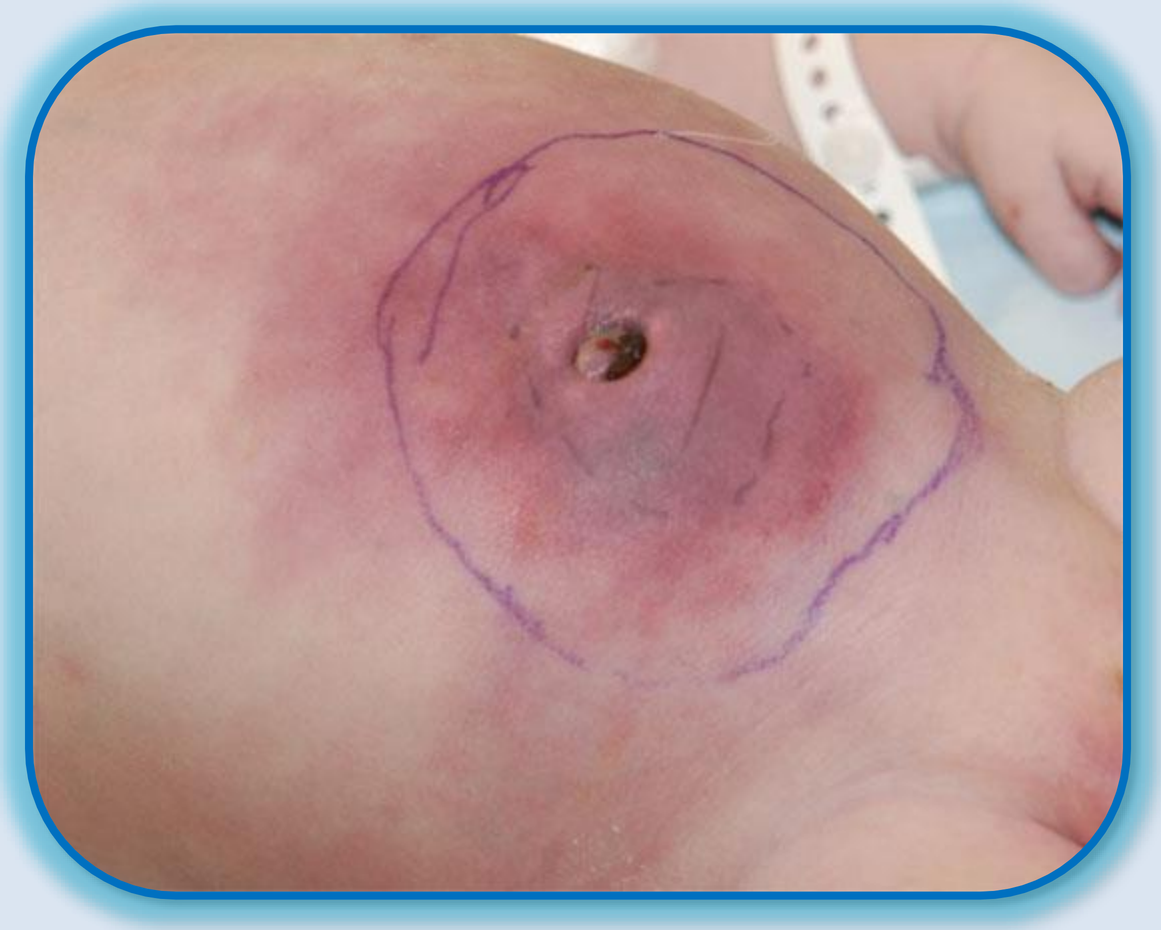


When **"dry cord care"** is the standard practice (no application of alcohol or triple dye), there are a number of infants who have a small rim of erythema around the drying cord.

Although this should be monitored to be sure progression does not occur to omphalitis, this minimal redness is thought to be related to the **normal WBC infiltration** that occurs naturally in the process of cord separation.

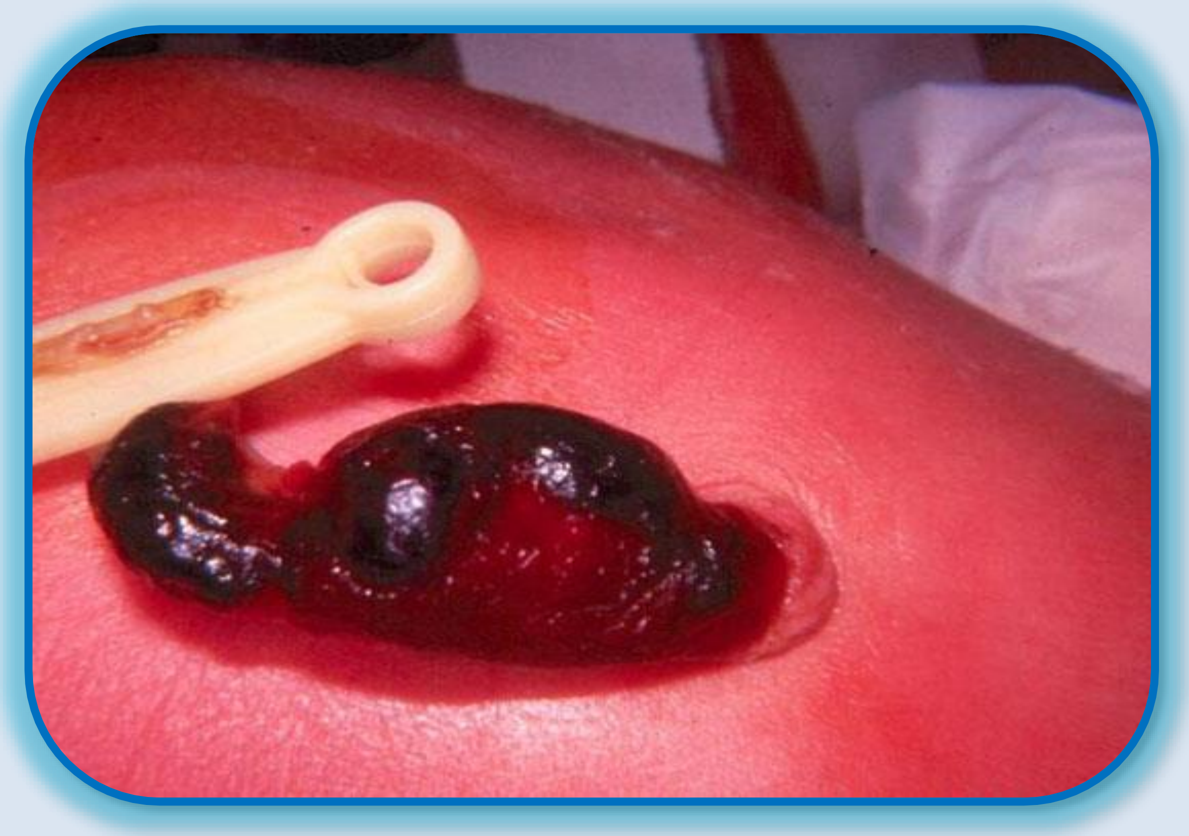
These otherwise well infants do not need evaluation.

Omphalitis



For comparison, this is the appearance of a full-blown case of omphalitis. The **progression of erythema** over time can be clearly seen from the circles marked on the abdomen. The first circle was drawn less than 12 hours after redness was initially seen, and the second circle was drawn several hours after that. Omphalitis of this degree can be fatal, even with aggressive antibiotic therapy, so infection in this area should always be taken seriously.

Umbilical Hematomas

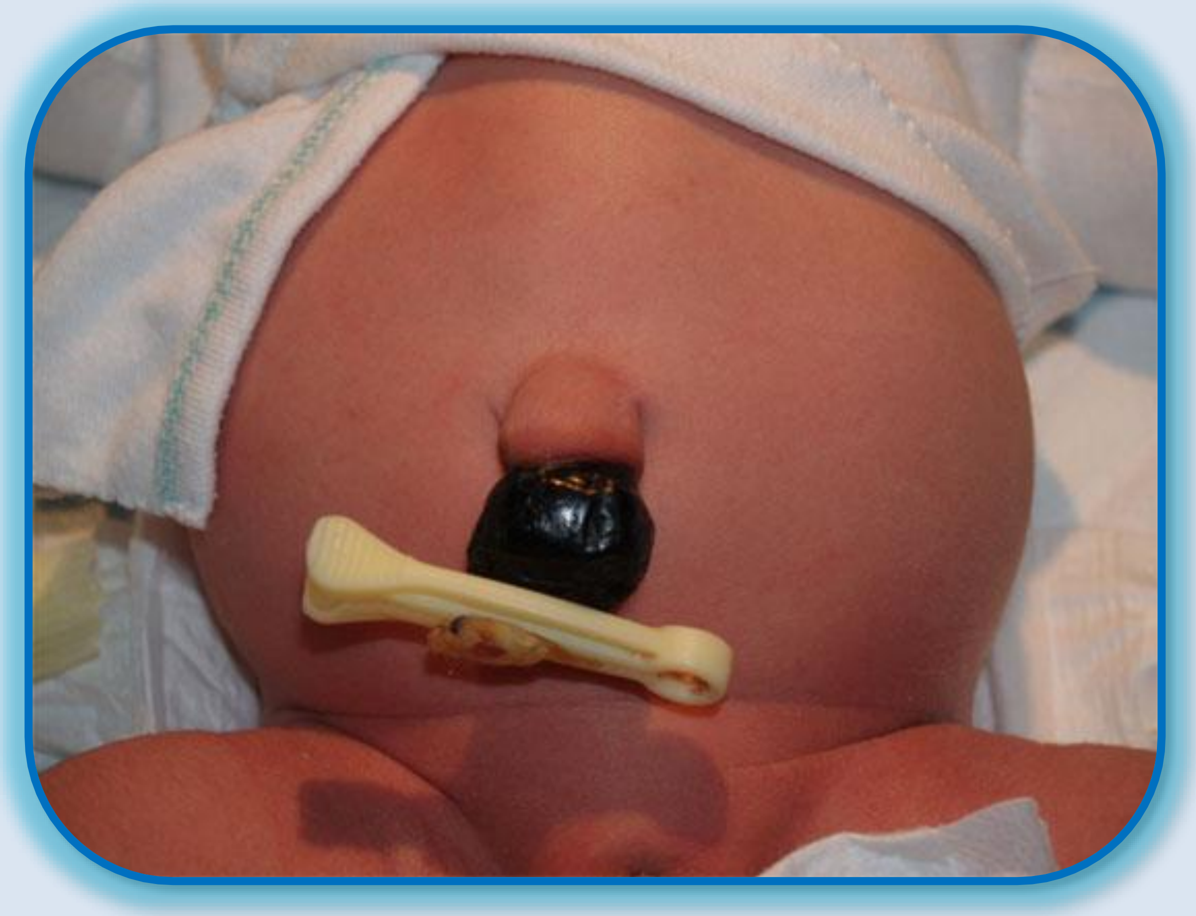


Umbilical hematomas are fortunately very rare (incidence approximately **1:5000**). They may be **spontaneous** or related to **trauma** from prenatal procedures or birth, but they are caused by rupture of the umbilical vessels, usually the umbilical vein.

When the rupture occurs **in utero**, fetal distress is common, and up to 50% of cases result in fetal death.

When noted as a physical finding in an otherwise well newborn, the hematoma is expected to resolve spontaneously and requires no additional evaluation.

Umbilical Hematoma

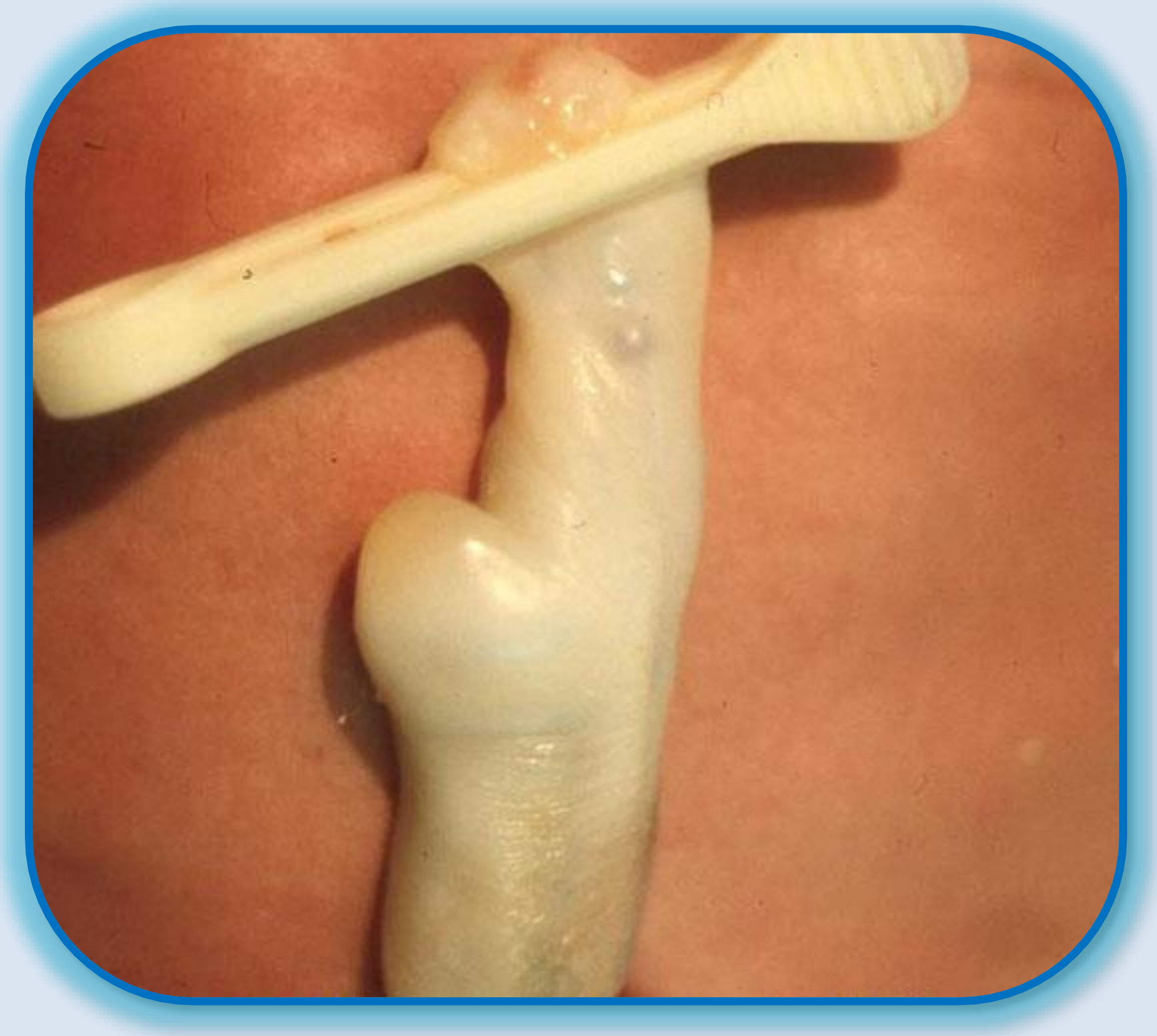


Here is another example of an umbilical hematoma.

Risk factors for this condition include short cord, vilamentous insertion, cord prolapse or torsion, traction on the cord, chorio-amnionitis, or post-dates delivery leading to thinning of the cord components with secondary aneurysm formation.

In this case, the infant had no distress either before or after birth, so no further evaluation was needed.

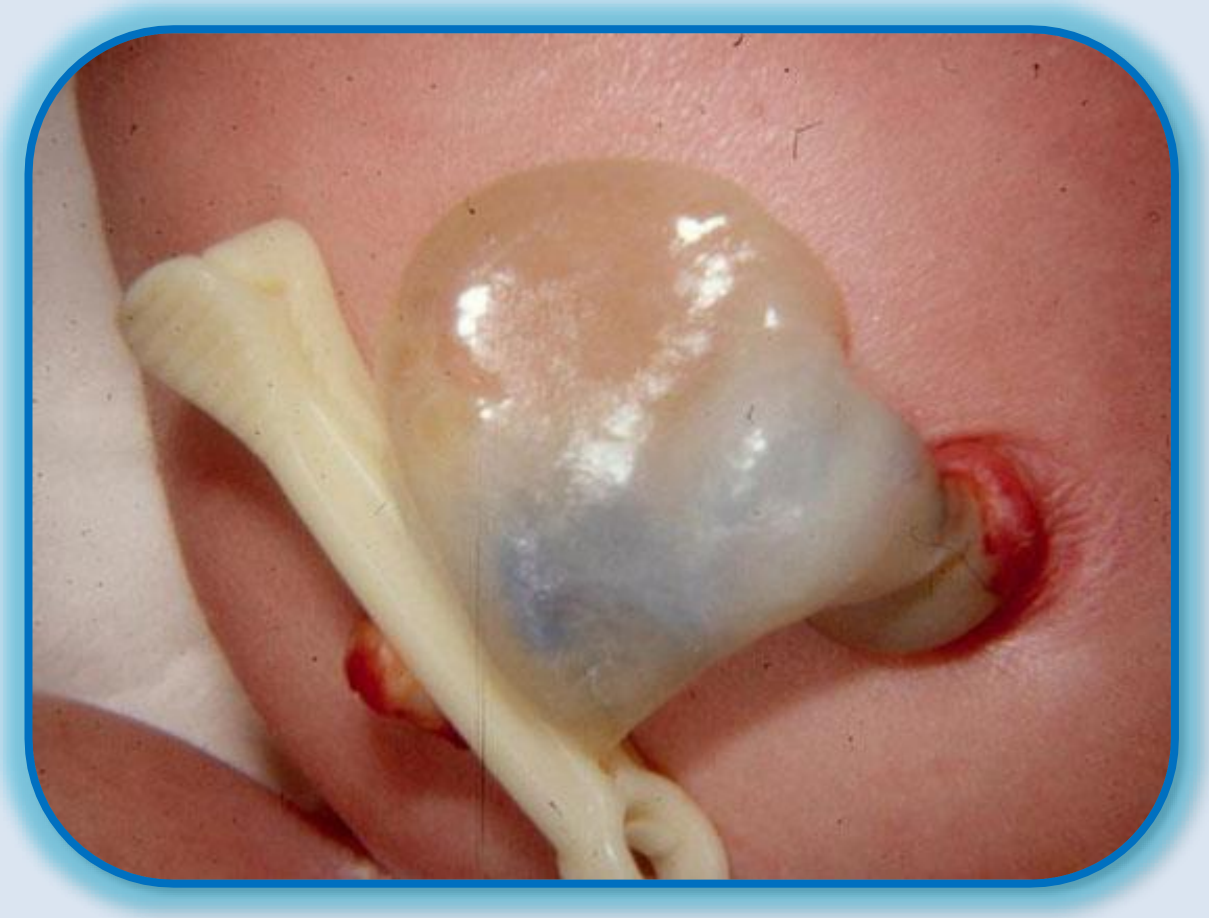
Umbilical Cord Hemangioma



A **very rare** anomaly of the cord.

Large hemangiomas can completely obstruct flow in the cord in utero or lead to high output cardiac failure. Fetal deaths have been reported.

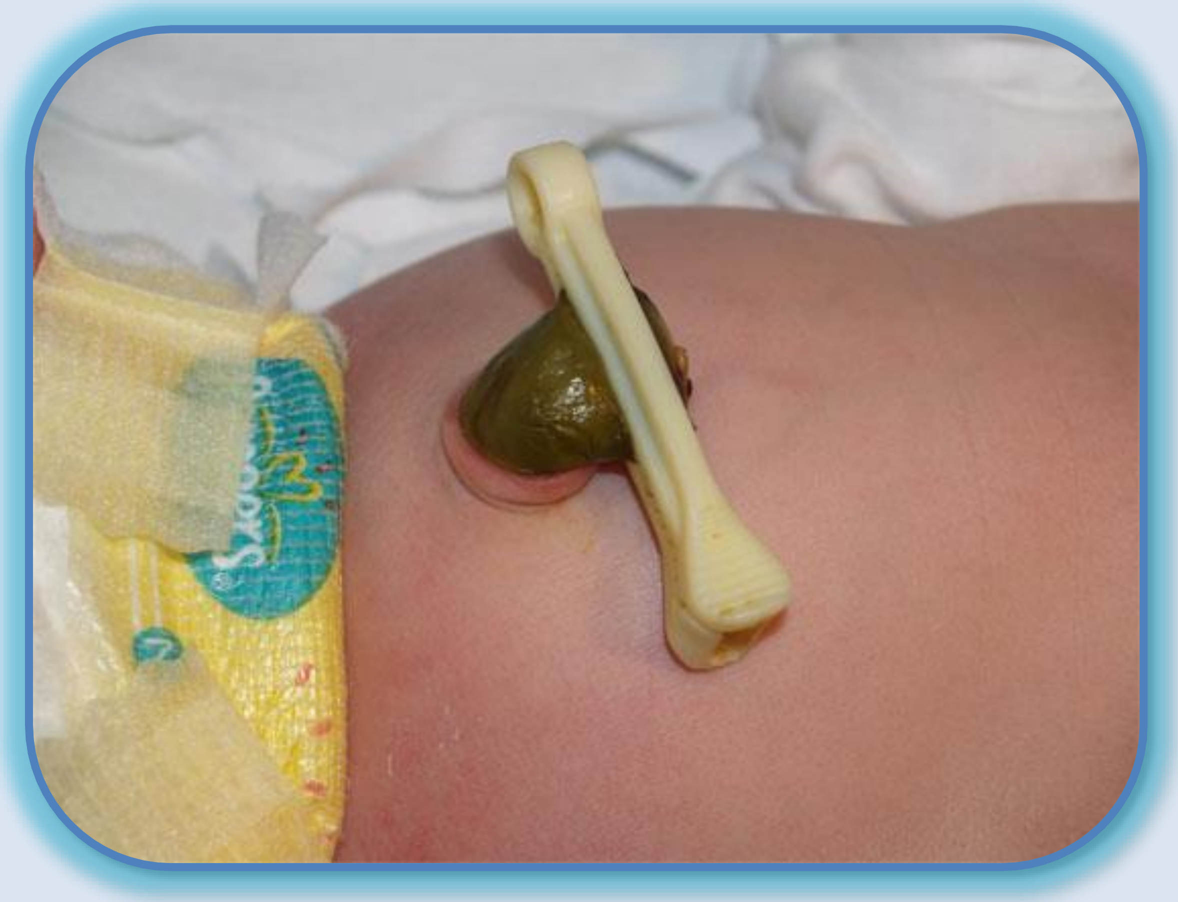
Wharton's Jelly Cyst



Also known as a **"false cyst"** of the cord, It is an area where liquefaction of the jelly has occured.

Up to **20%** of infants with this condition have **associated anomalies**.

Meconium Stained Umbilical Cord

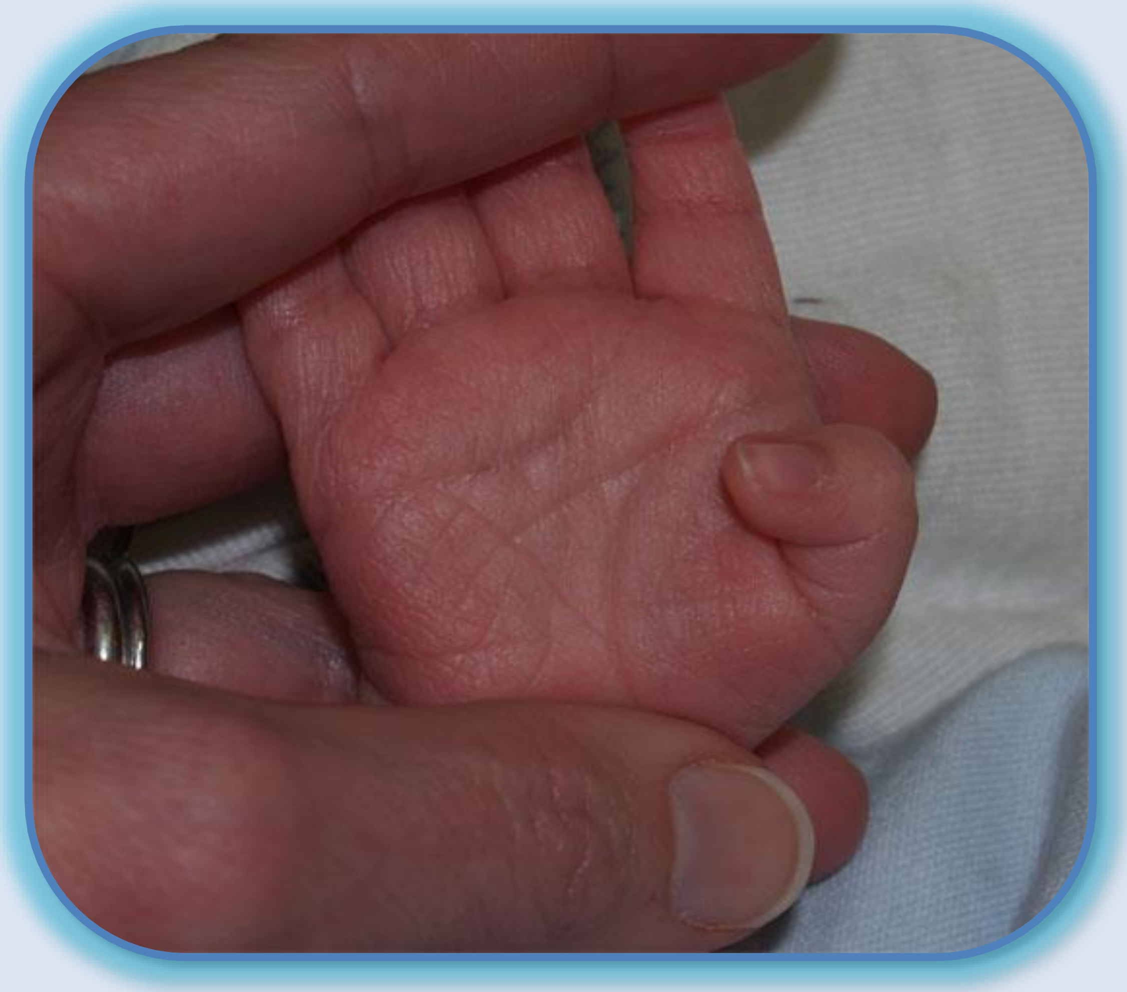


This cord is about 7 hours old, but the normal light yellow color is not visible. This cord was stained by the presence of meconium in utero, which gives it a dark green color.

In addition to the umbilical cord, meconium staining is also frequently seen on the nails.

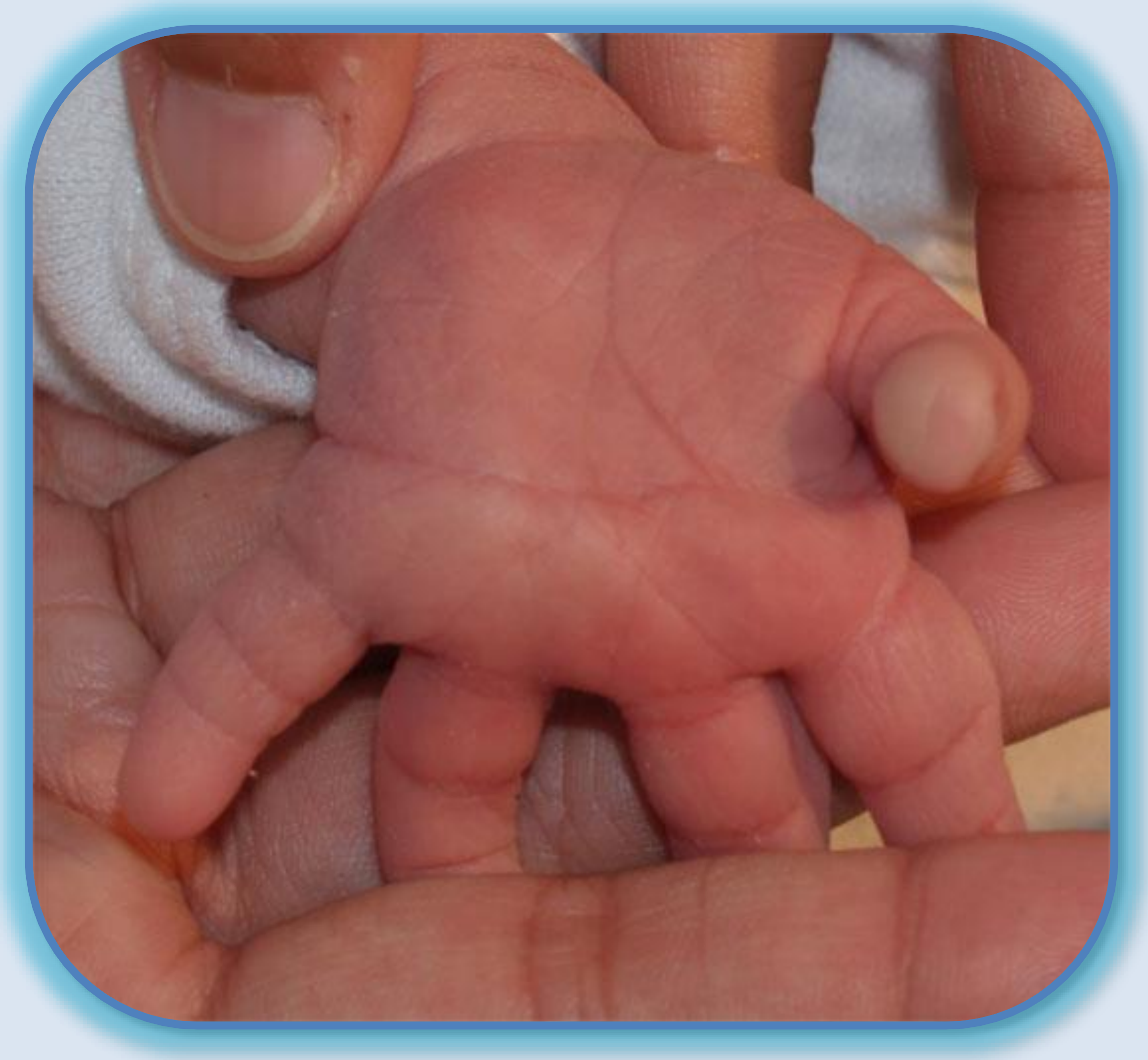
Extremities

Normal Hand Crease



Most newborns have two major creases on the palm, neither of which completely extend from one side of the palm to the other.

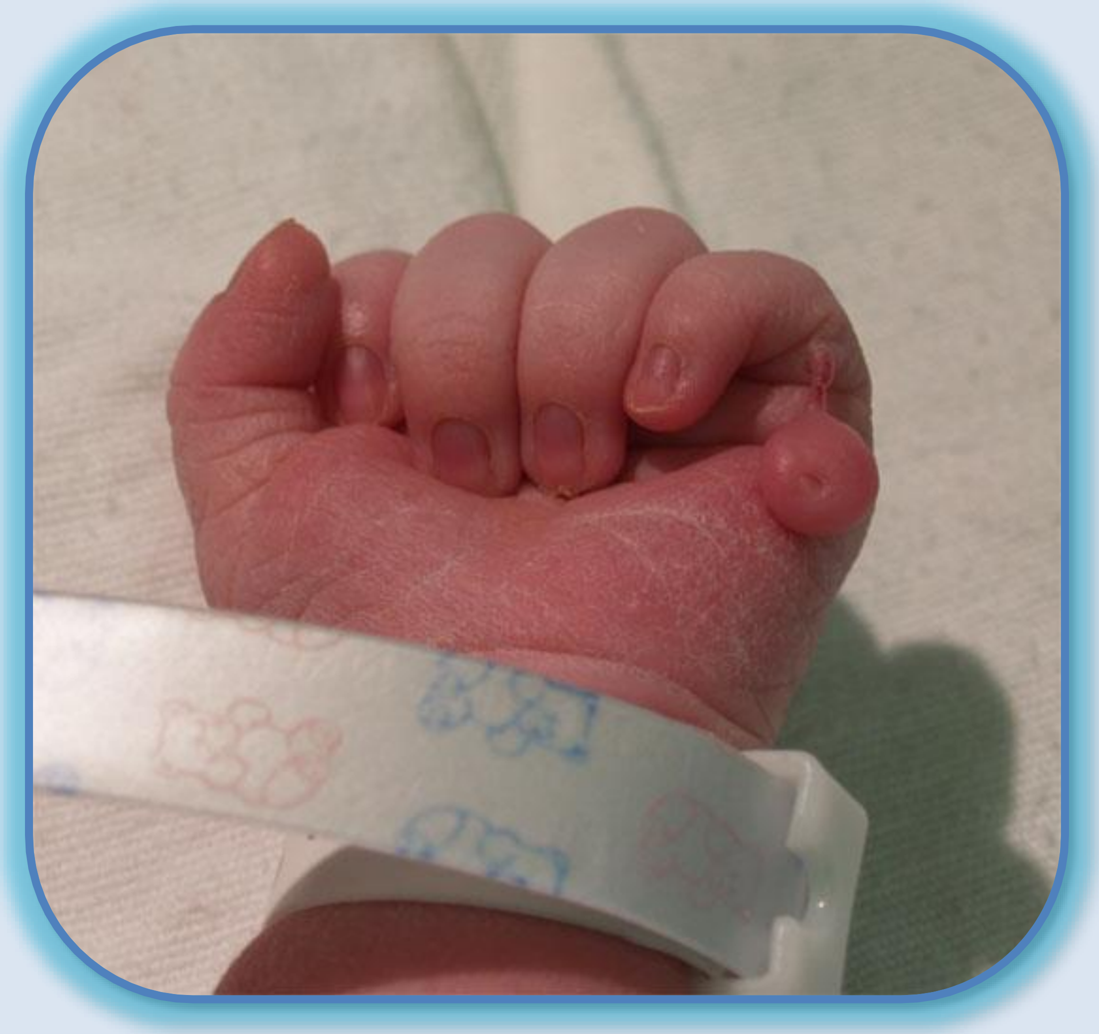
Transverse Palmar Crease



A **common** variant, found in approximately **5%** of newborns, a transverse palmar crease is frequently inherited as a familial trait.

Although single palmar creases are also associated with **Down's syndrome** and other genetic disorders, the absence of other abnormalities on physical exam should reassure the examiner that **no** further evaluation is necessary.

Postaxial Polydactyly

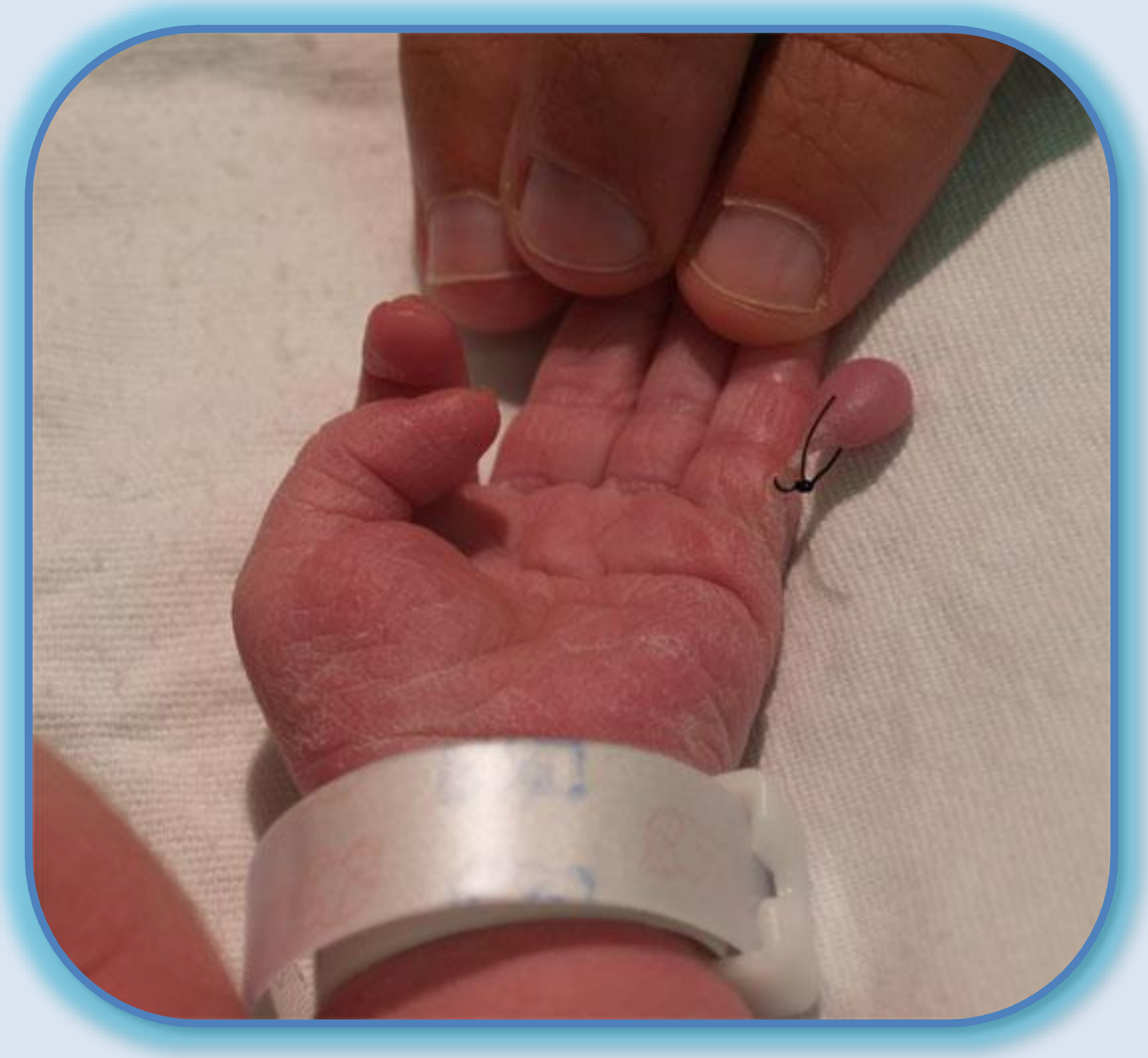


Postaxial polydactyly is the most common variety. The extra digit may seem almost fully formed or may be attached only by a thin fleshy stalk.

This is typically an **isolated** finding.

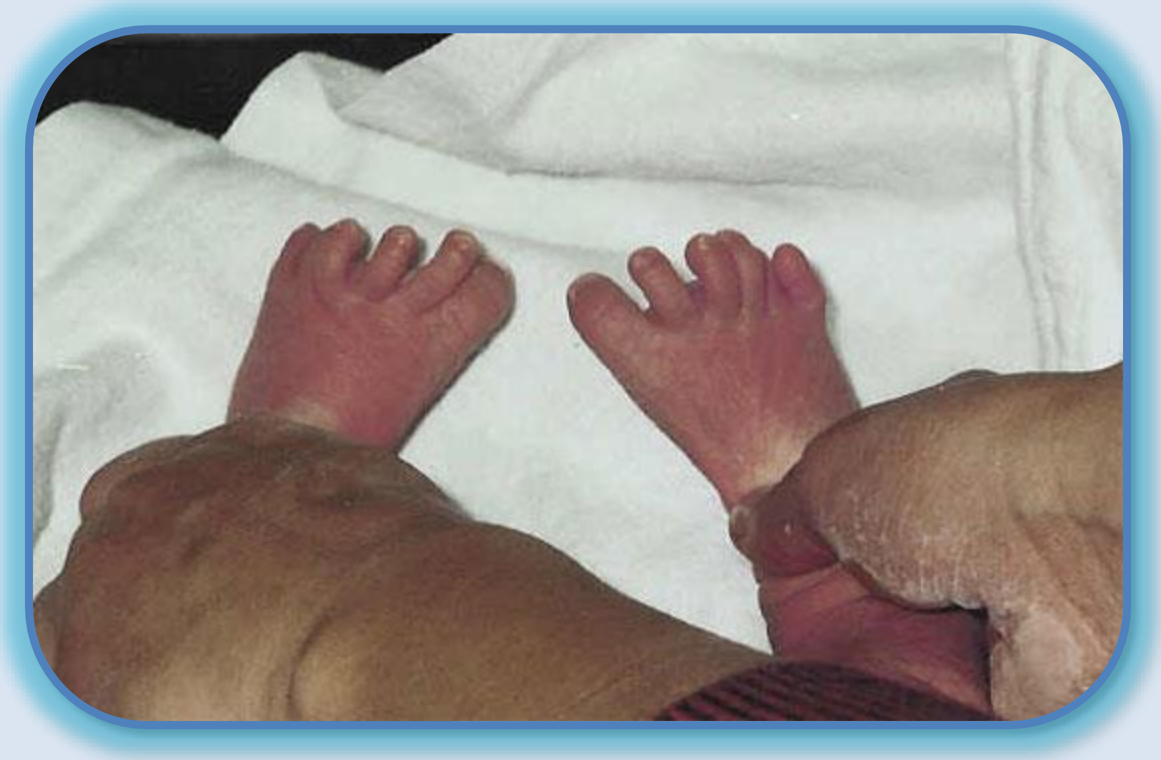
A **positive family history** is often obtained.

Postaxial Polydactyly



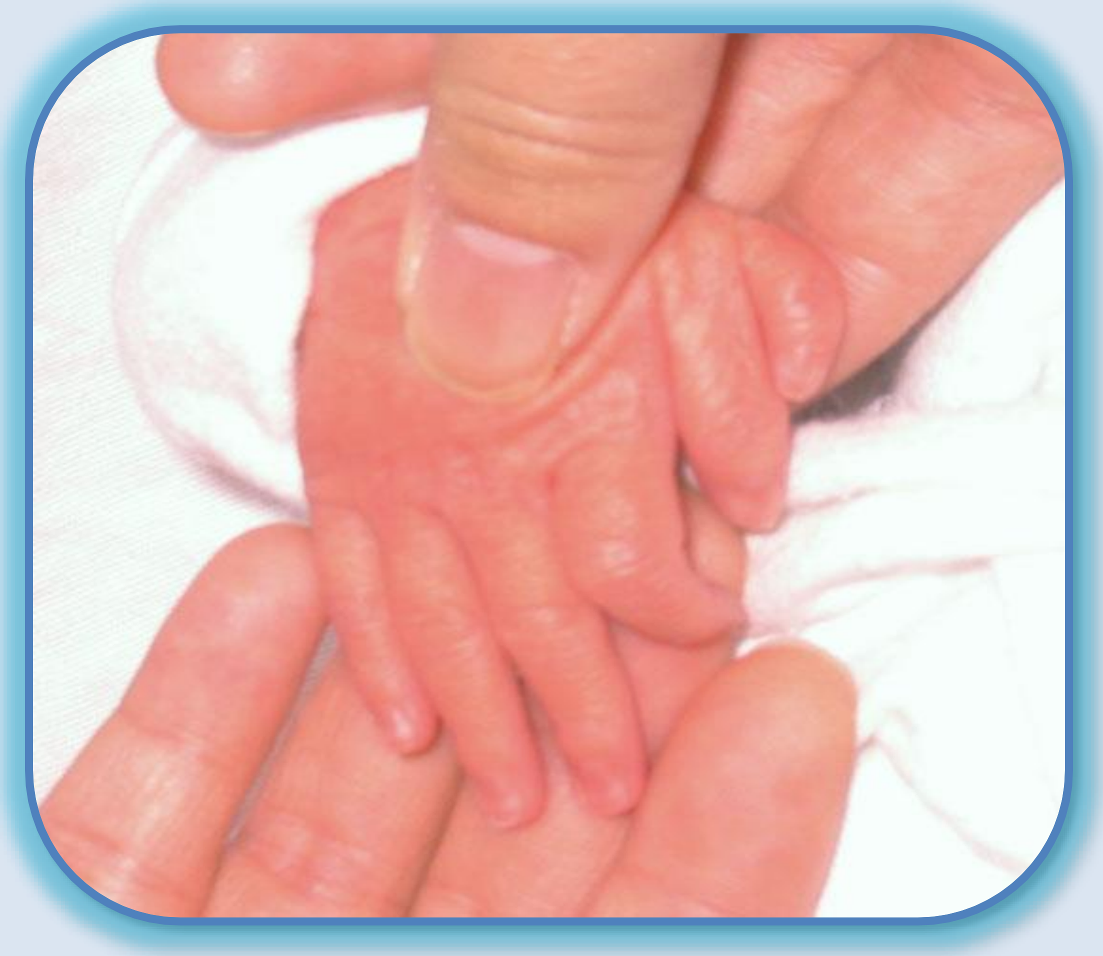
In cases where the attachment of the extra digit is very thin, the appendage can be successfully tied off with a silk suture.

Postaxial Polydactyly



Another example of postaxial polydactyly which is **bilateral** and the extra digits are **fully formed**.

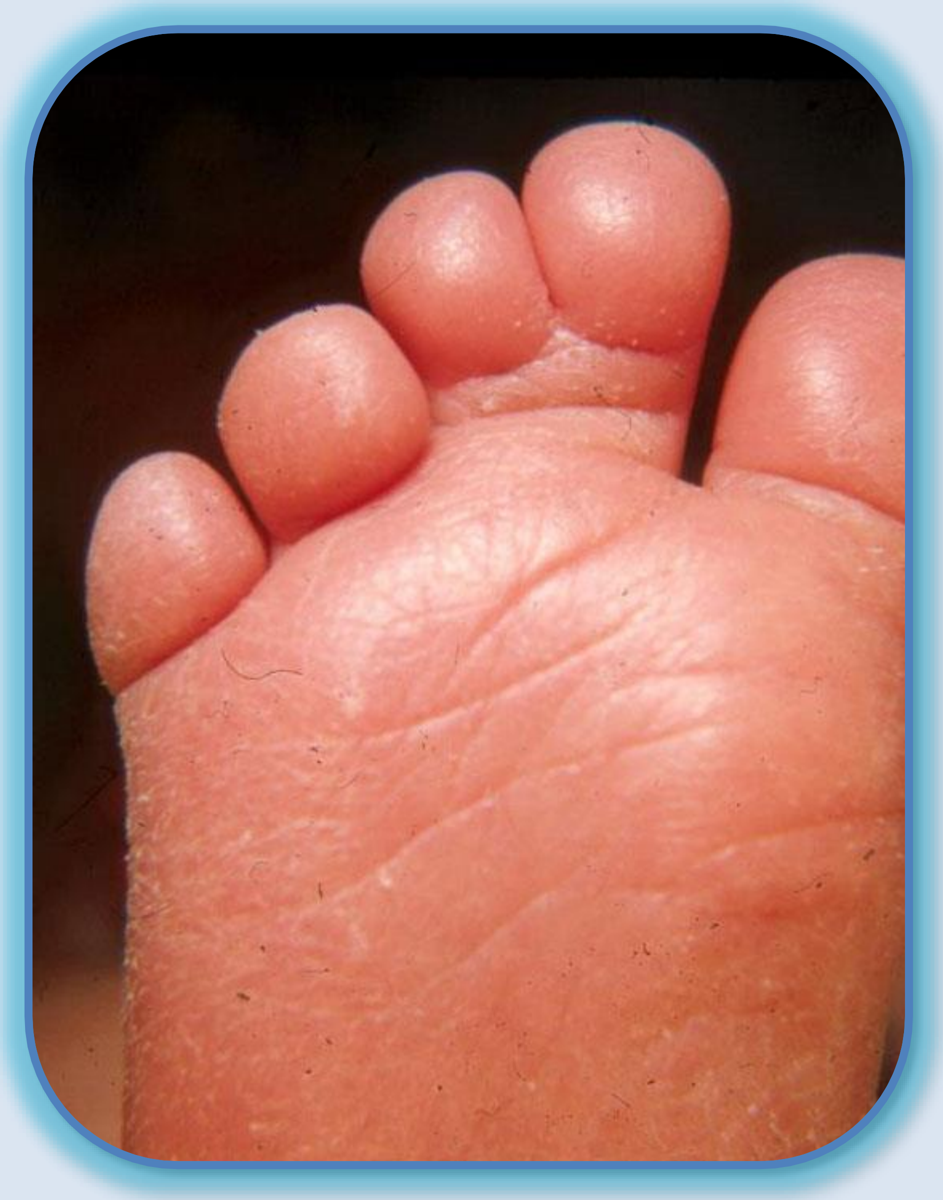
Preaxial Polydactyly



This infant has polydactyly of the thumb as an isolated physical finding. There was no family history and the finding was unilateral. **Preaxial polydactyly is much less common** (and **more likely to be related to an underlying medical condition**) than the postaxial variety.

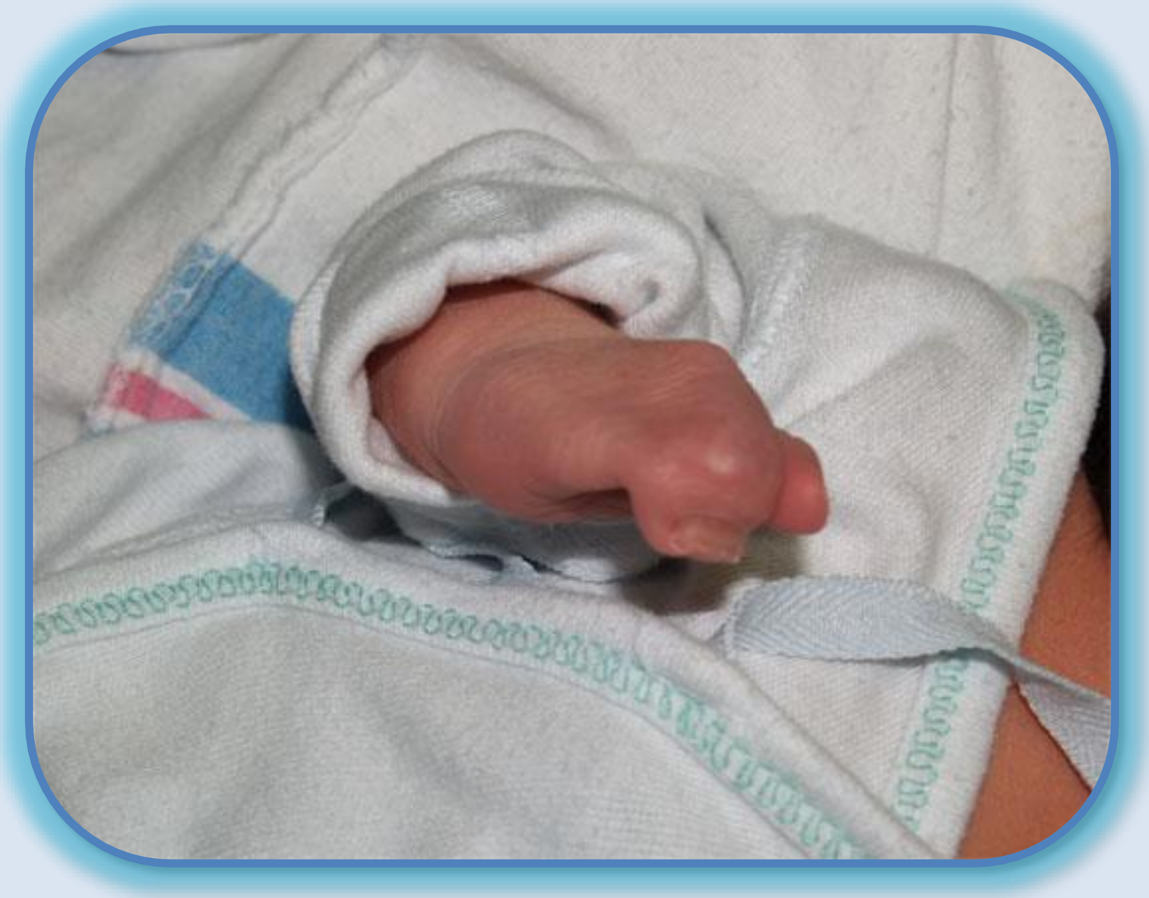
Surgical correction is generally delayed for several months to lessen the risk of general anesthesia.

Syndactyly of the Toes



This type of mild syndactyly is found occasionally on the physical examination. Again, this is a **subtle** finding. If the exam is not a careful one, this can easily be missed since both digits are otherwise normally formed. This is usually an **isolated** finding, and in this location, has no impact on function.

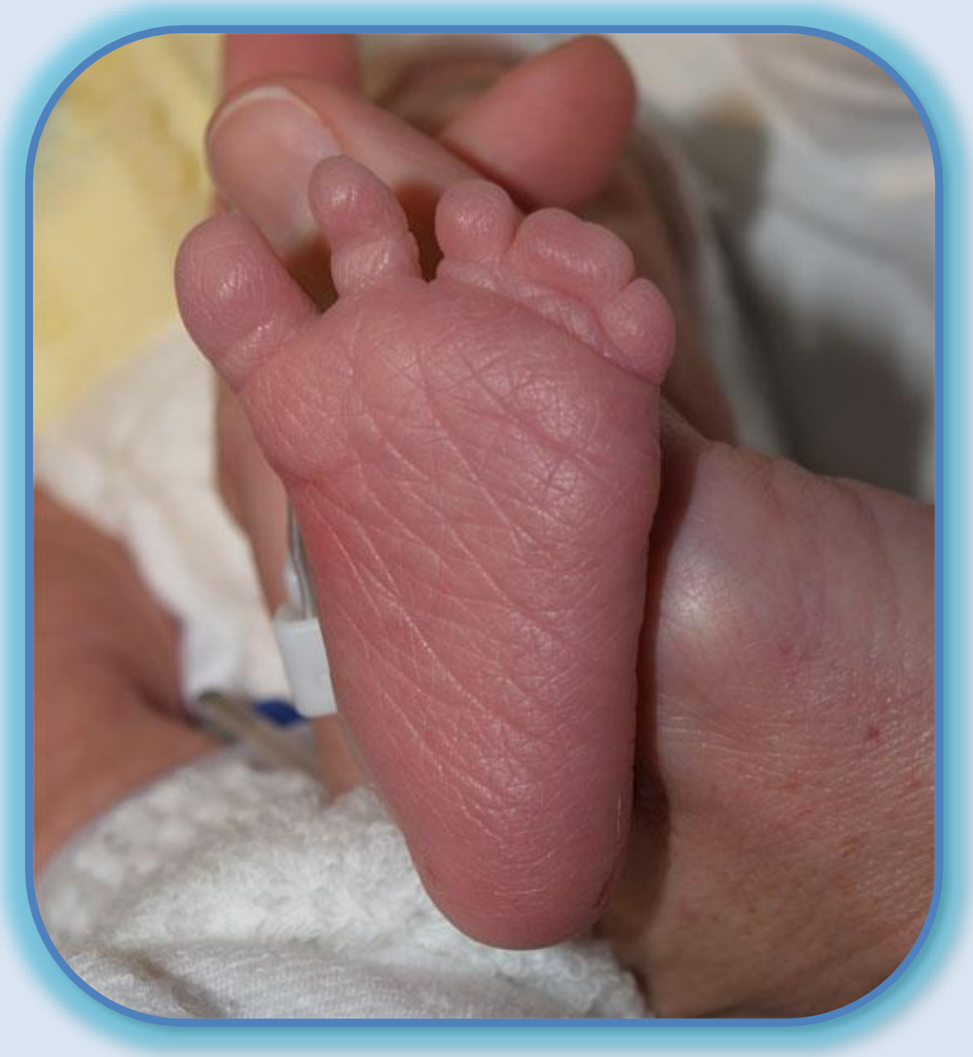
Syndactyly



In this case, the syndactyly is **severe**. All four of the digits on the right were completely fused together (notice the four fused nail beds). The thumb was normally formed and can be seen to the right of the abnormal area.

This was a unilateral, isolated finding in an otherwise well newborn; amniotic bands were thought to have caused this problem.

Polysyndactyly

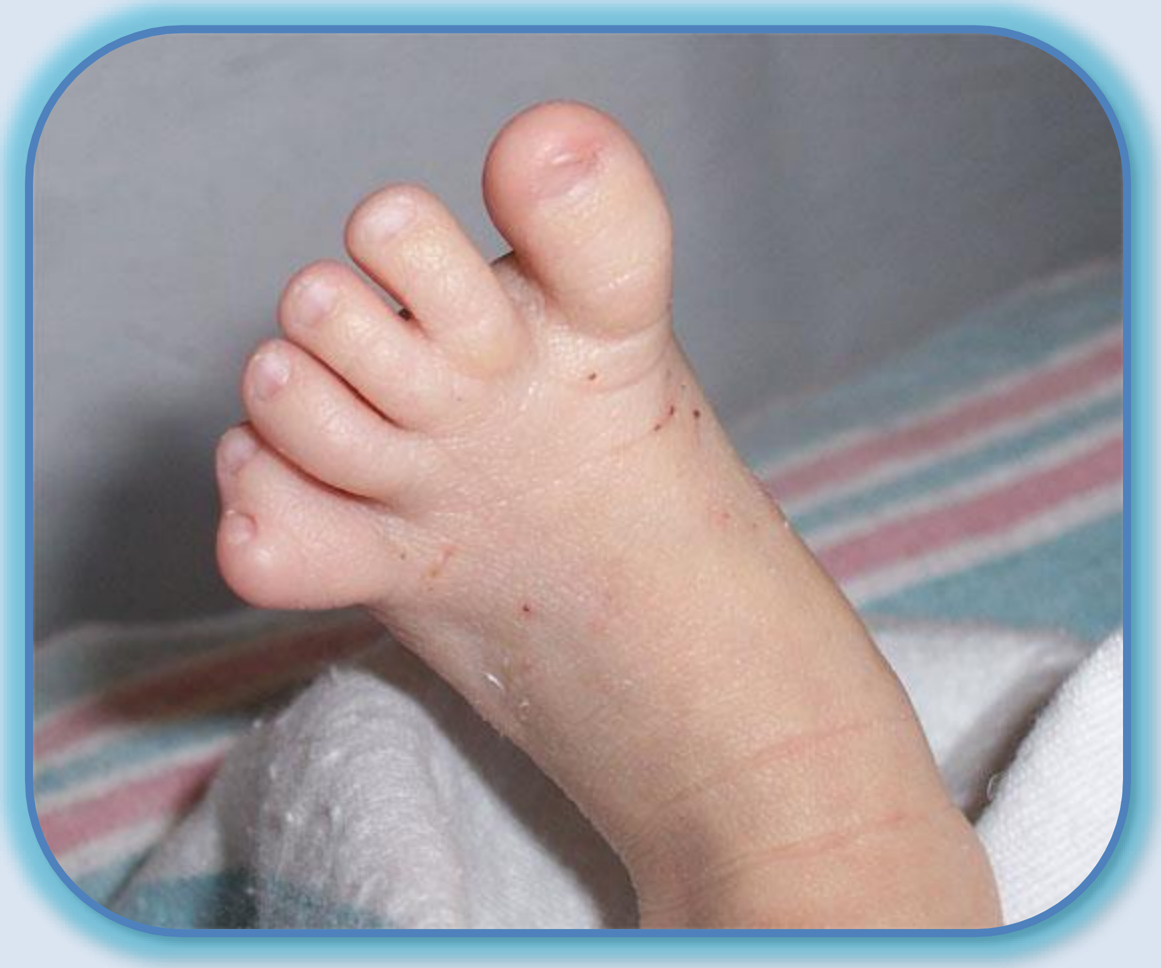


When the digits are fused in addition to being too numerous, the term polysyndactyly is used.

Careful examination is important to identify conditions such as this. If the socks (or mittens) are not removed, this finding can be easily missed.

While this is not expected to cause a significant functional problem, cosmesis can be of concern as the child gets older.

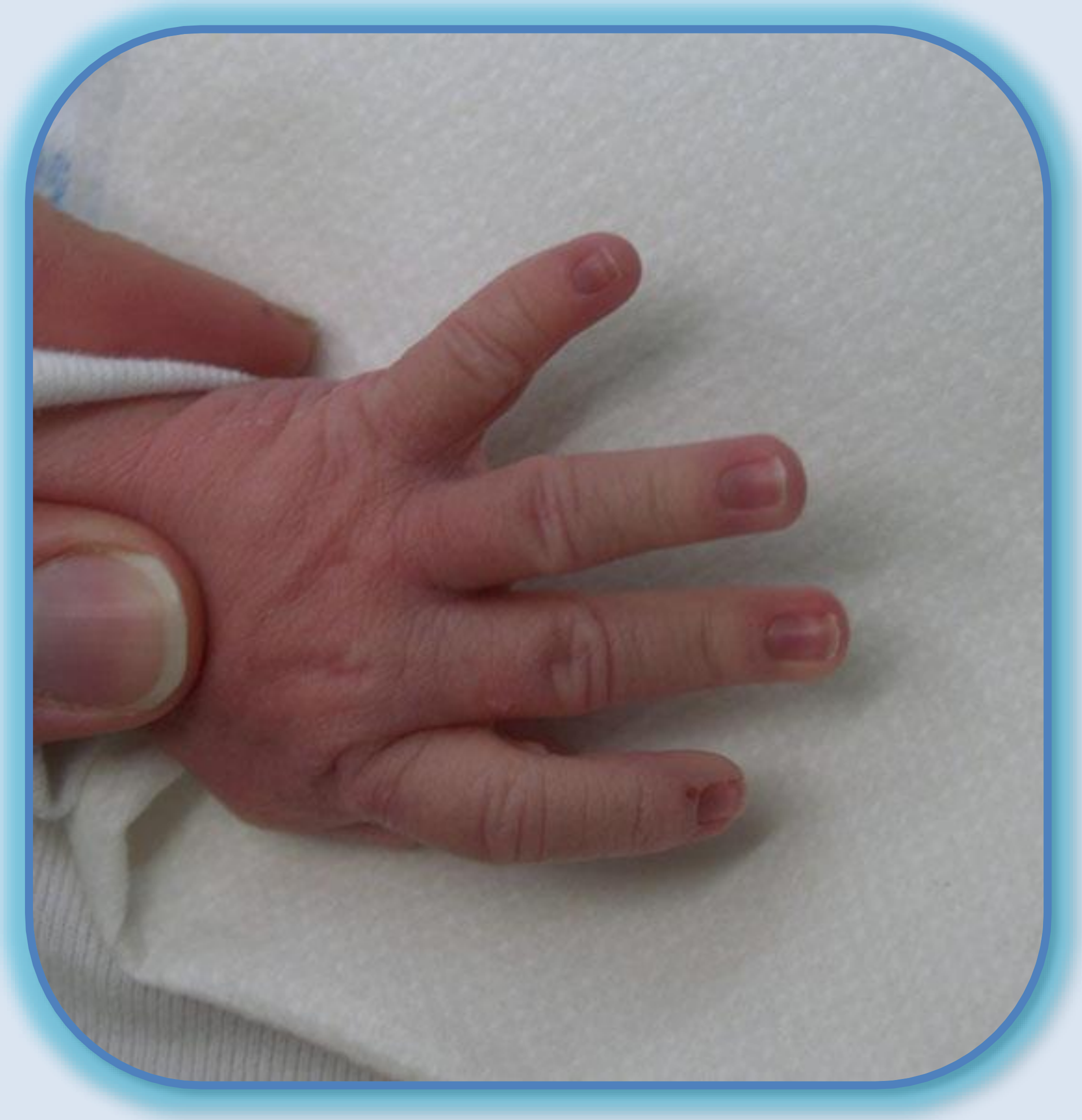
Polysyndactyly



Here again polysyndactyly is present.

In this case, the fifth and sixth digits are completely fused to each other. With careful inspection, a partial syndactyly of the second and third toes is also seen.

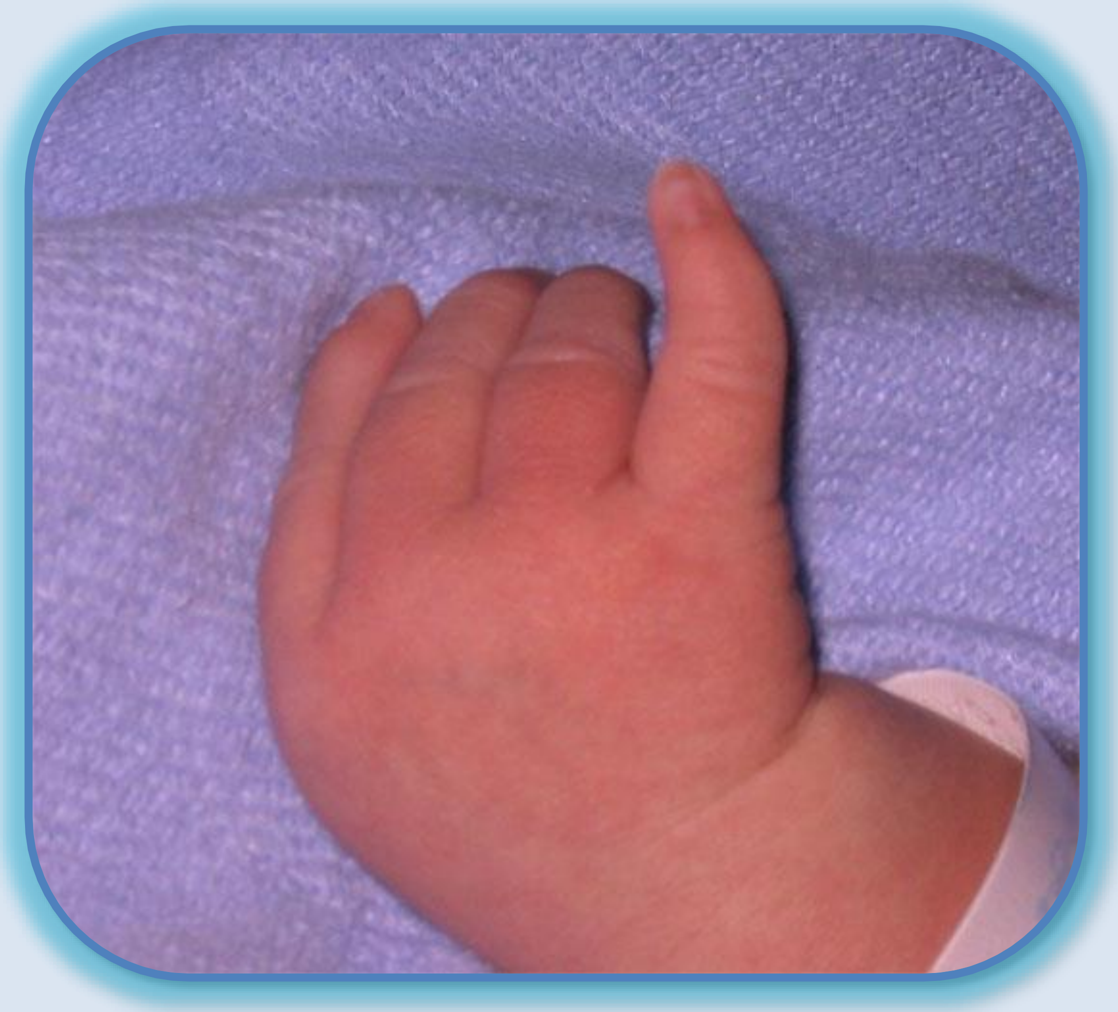
Clinodactyly



A slight medial **incurvation of the fifth finger** is a frequent finding on the newborn exam. It is often inherited as a familial trait.

Although it can be associated with several genetic disorders, including Down's syndrome, the absence of other physical findings will confirm that it is a benign, isolated finding. In this case, no further evaluation is necessary.

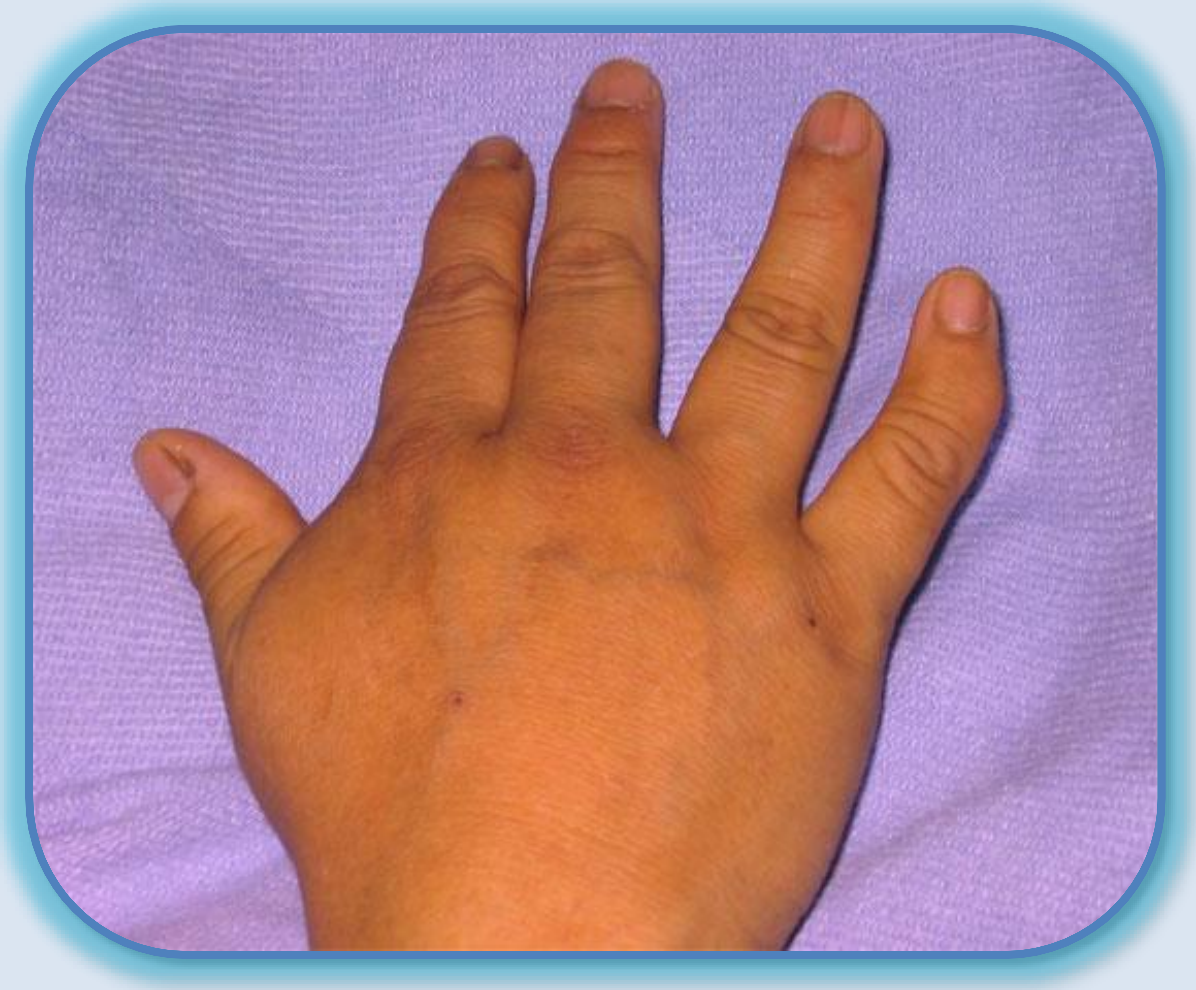
Clinodactyly



This infant has a more pronounced curvature.

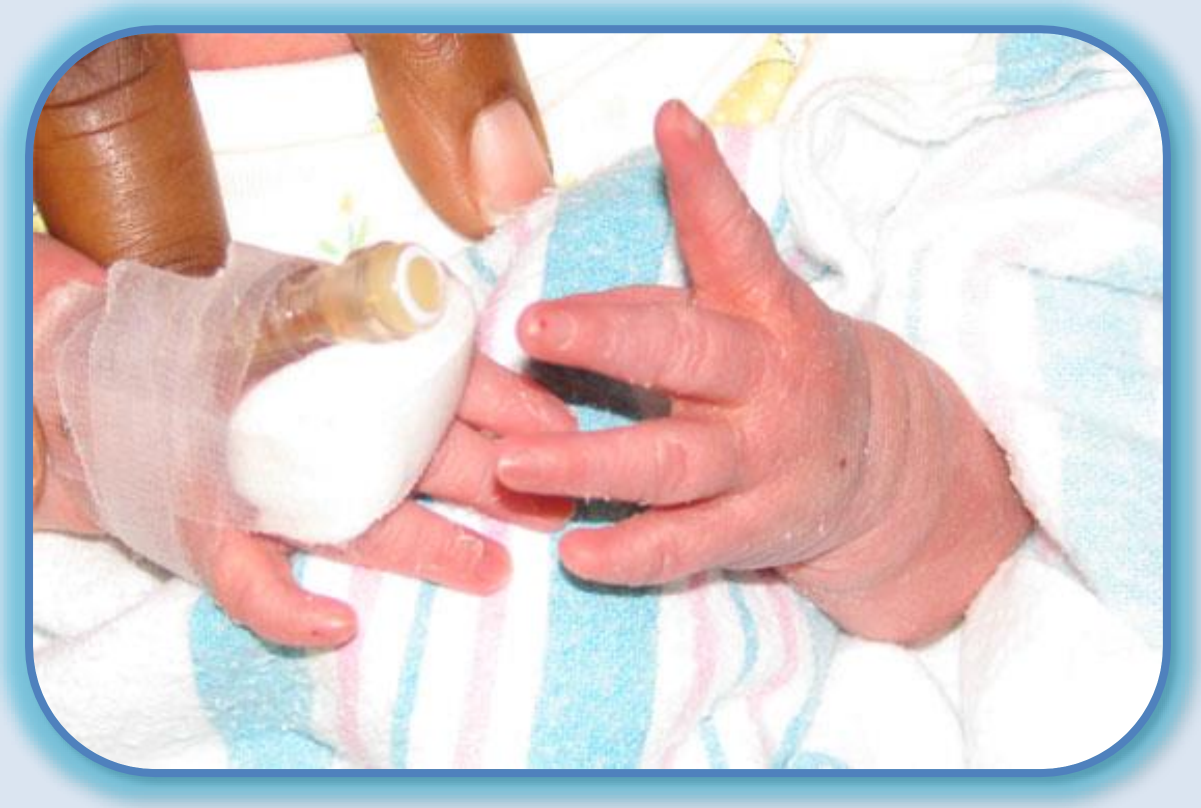
Again, this was an isolated bilateral physical finding. As seen in the next photo, this appearance was not a surprise for the mother, who had this trait as well.

Clinodactyly



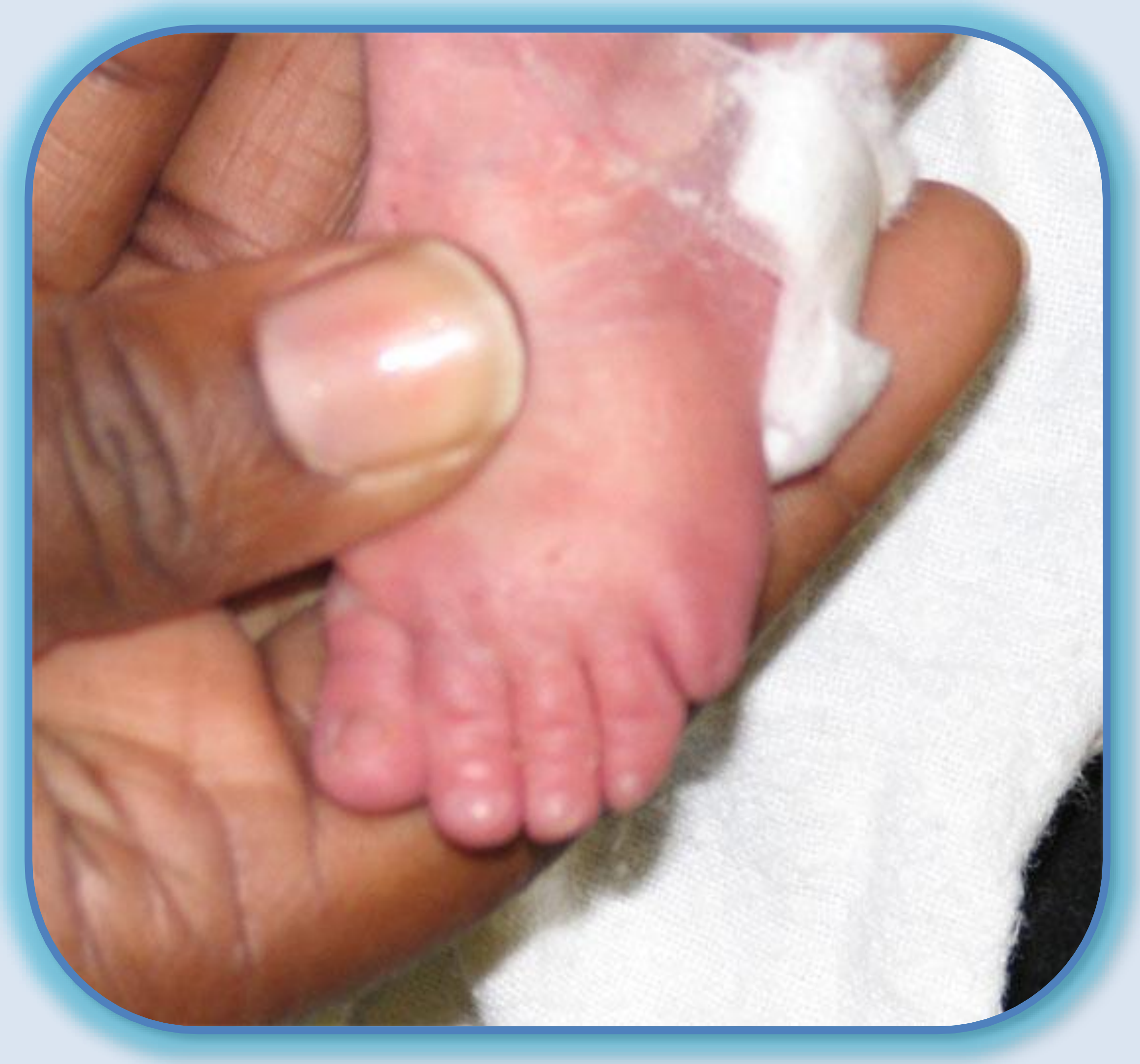
Here is the right hand of the mother of the infant in the previous photo. Both mother and baby were healthy **(this is a benign finding when isolated)**.

Finger Hypoplasia



On first inspection, this infant's hands may appear normal, but on closer inspection, the **fifth fingers bilaterally appear hypoplastic**, and there is a complete absence of the nail on the infant's left side.

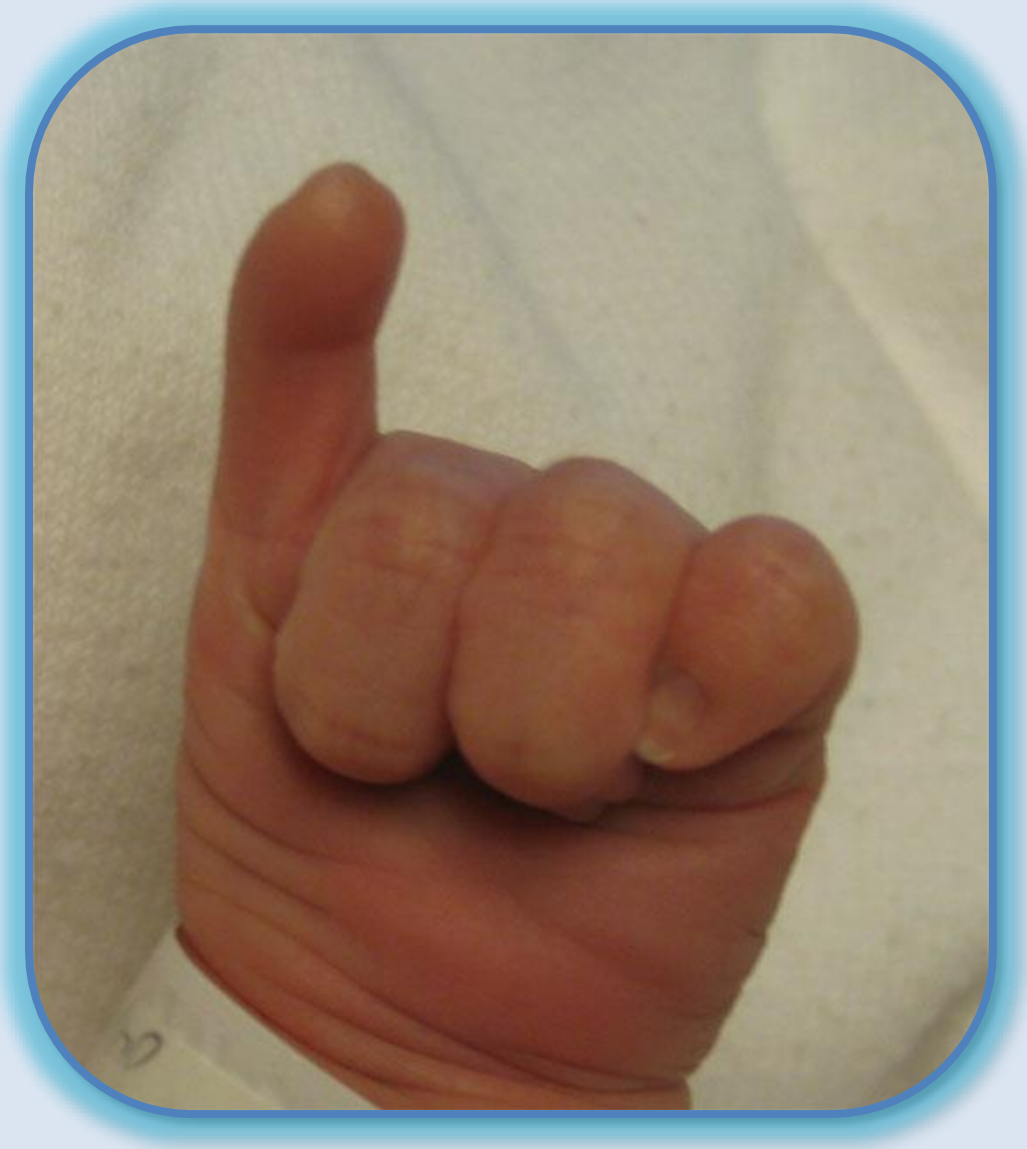
Toe Hypoplasia



This is the same patient as the previous photo.

Here, hypoplasia of the fifth toe (and nail bed) is apparent. This will not create a functional problem, but these findings did lead to an underlying diagnosis of **Coffin-Siris syndrome**.

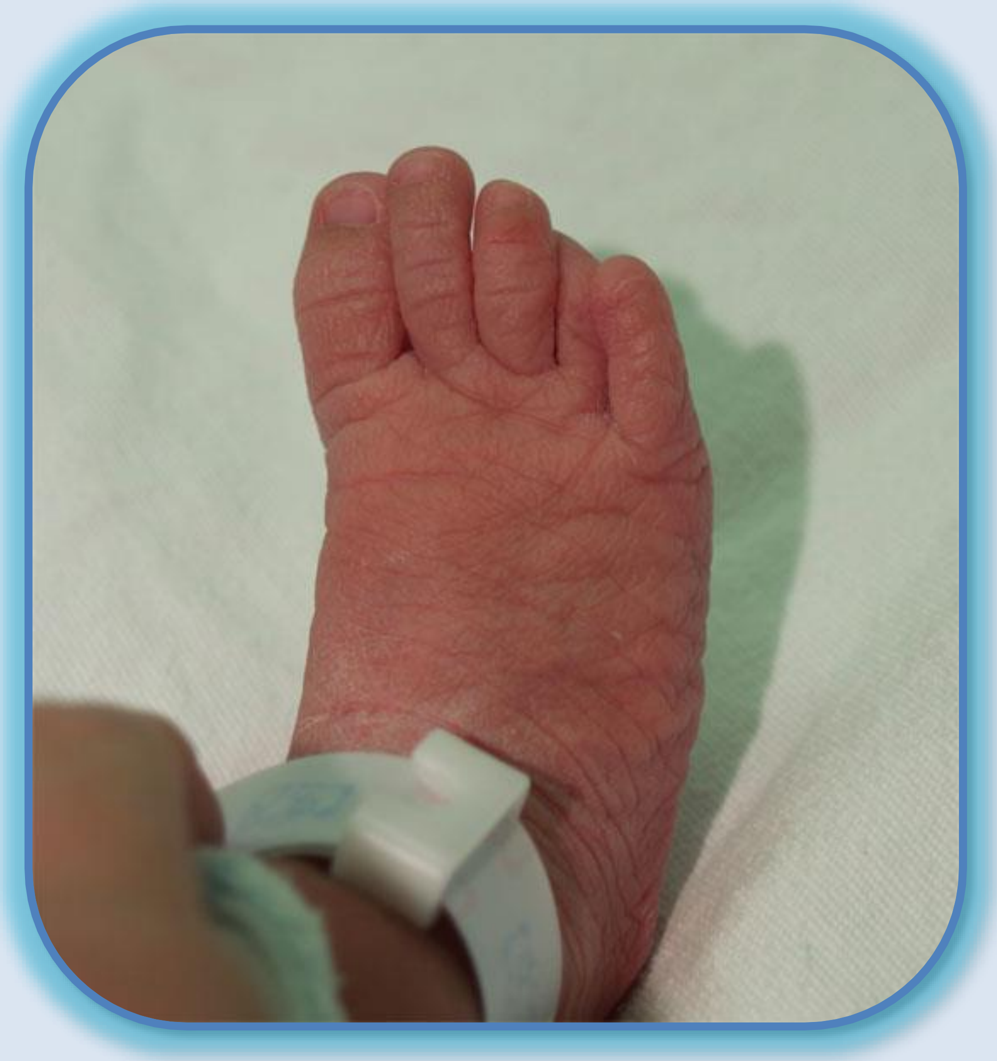
Thumb Aplasia



Whenever digits are missing, underlying genetic or chromosomal diagnoses should be considered.

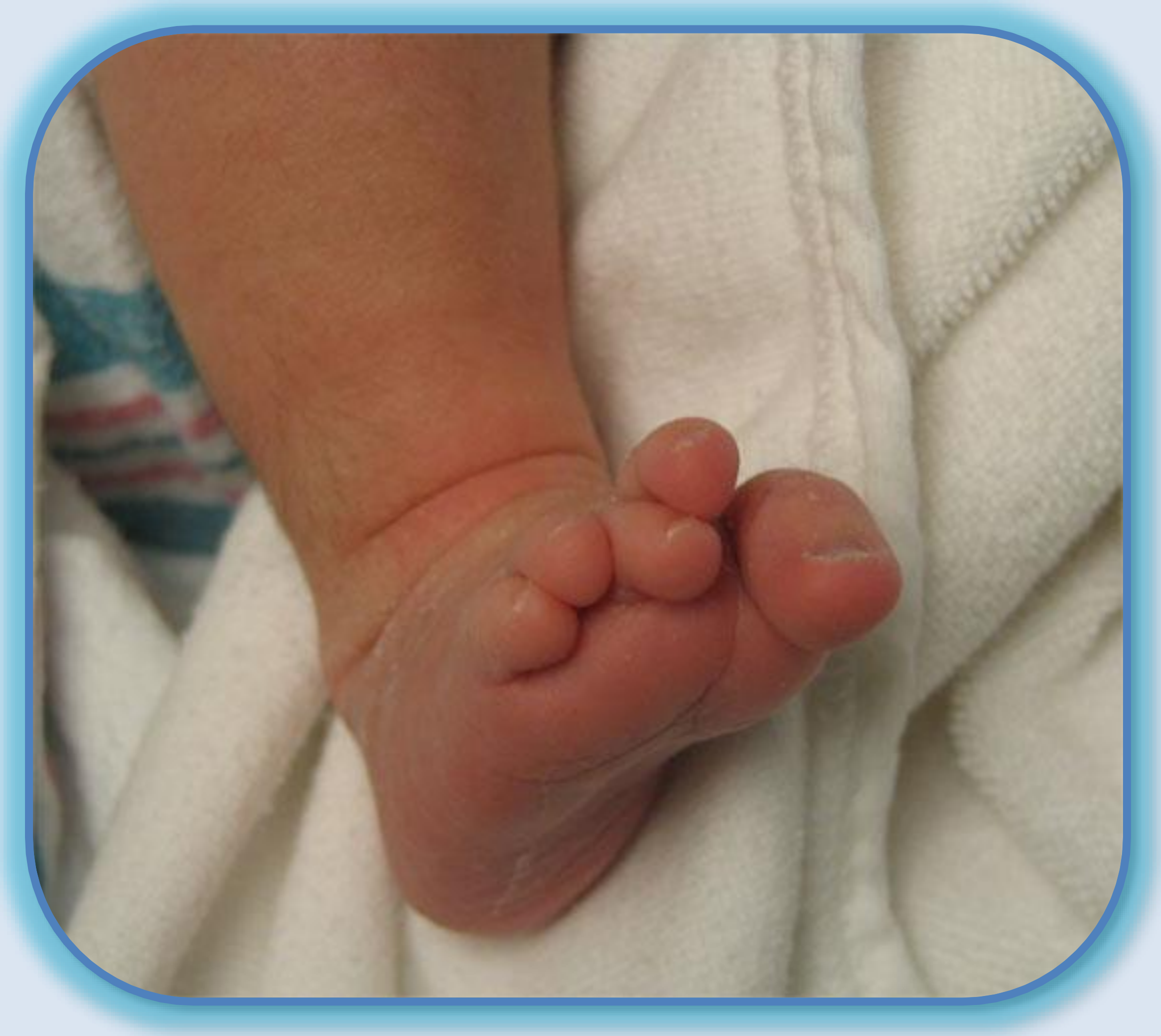
Amniotic bands could also be responsible for absence of a digit, **but** in those children, the physical examination should be otherwise normal.

Overlapping Toes



Some newborns will have toes that seem to overlap one another. At times, this is related to clinodactyly of one of the digits; at times, it is a positional deformity. Either way, it is considered a **minor deformity**. **As an isolated finding, this is of no significance.**

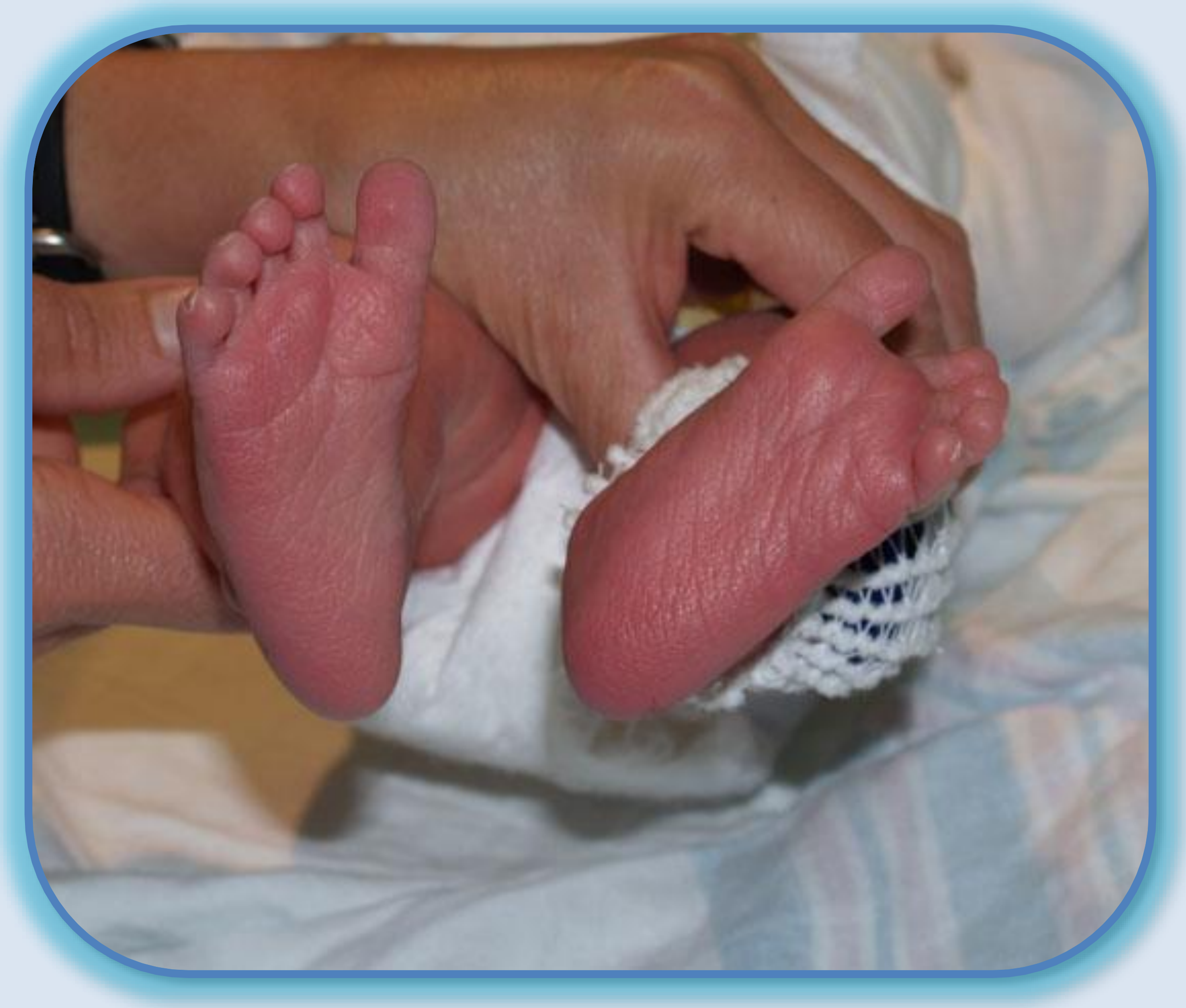
Overlapping Toes



This infant has more marked overlapping of the toes.

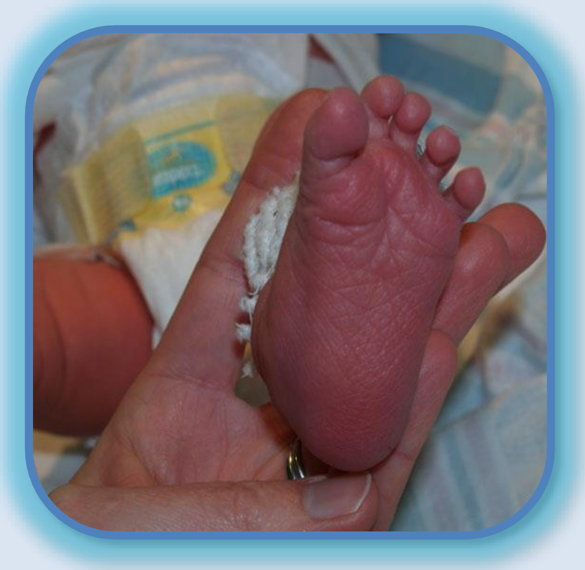
This child did have an underlying genetic diagnosis, but there were other abnormal physical findings present.

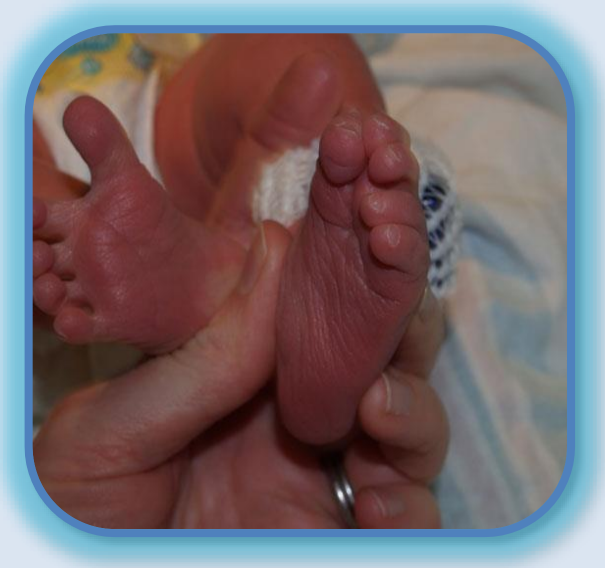
Positional Deformity of the Foot



This infant appears to have a deformity of the left foot. Although bony deformities can occur, positional deformities are much more common. The following photos will show that this position is **flexible** and is therefore due to in utero position. **Spontaneous resolution** is expected.

Positional Deformity of the Foot

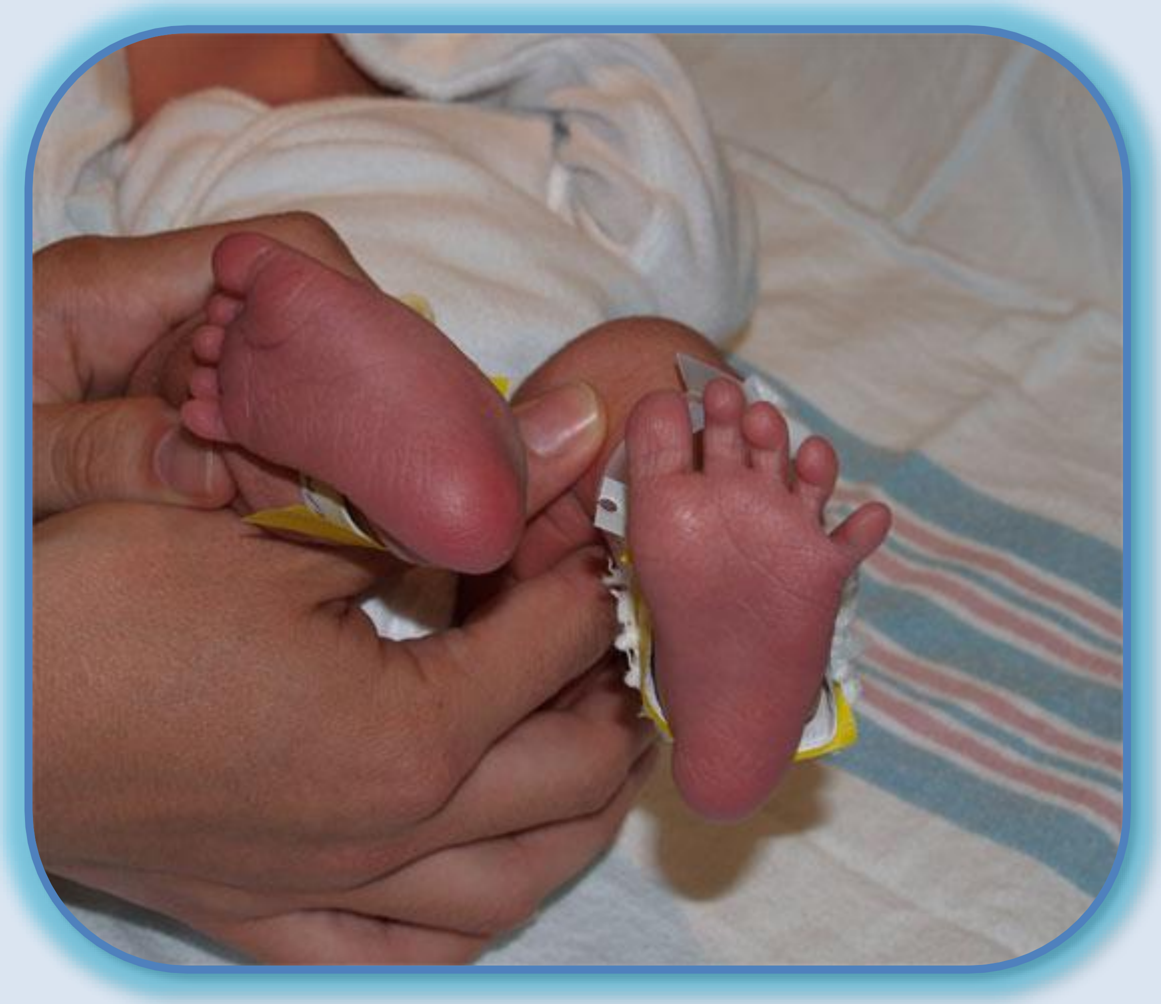




A closer view shows how the sole appears to be **everted**

With gentle pressure on the medial malleolus and the lateral aspect of the sole, the foot can be easily brought into a neutral position.

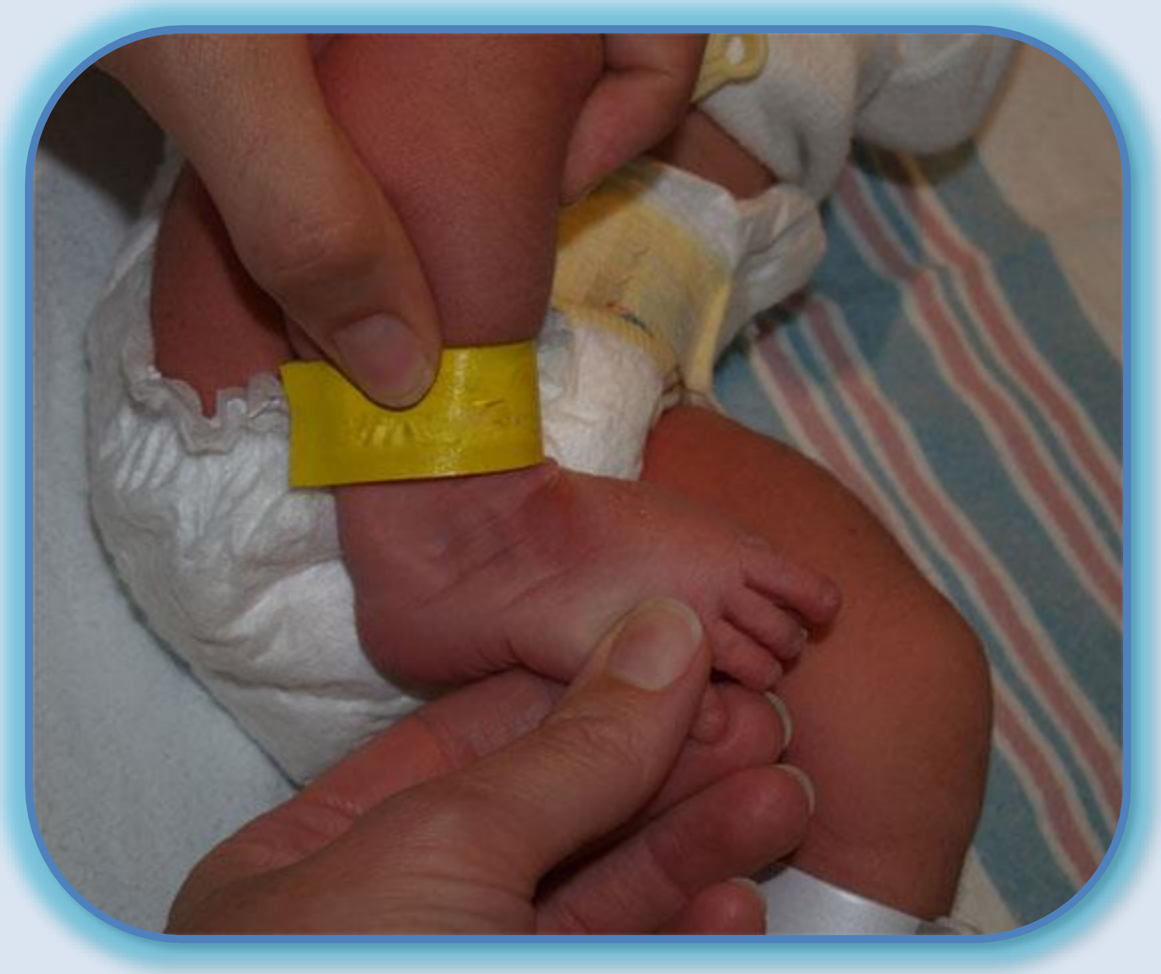
Positional Deformity of the Foot



Another example of a positional deformity.

In this case, the foot is **dorsiflexed** to such a degree that it is almost flat against the lower leg.

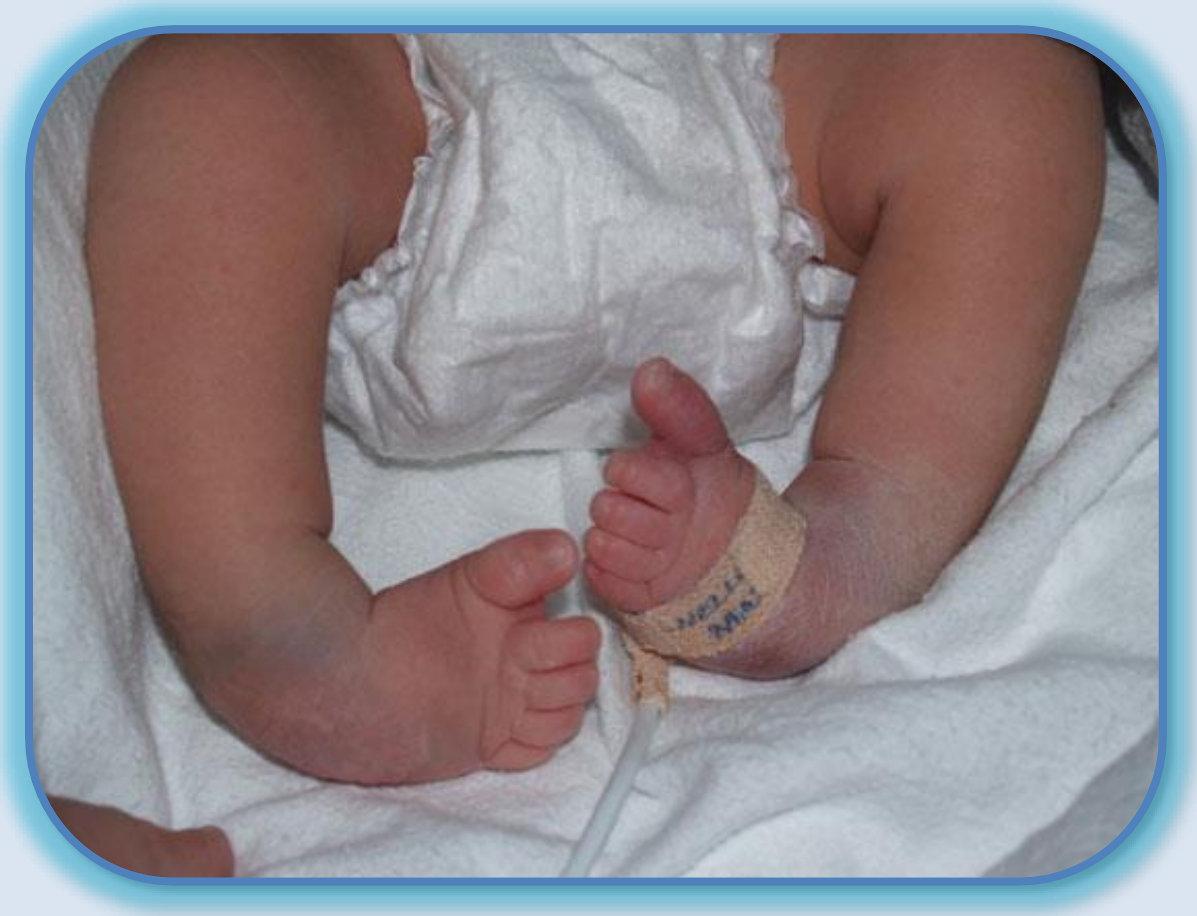
Positional Deformity of the Foot



Here again, the foot can **easily be brought back to a neutral position**. A concavity due to the unusual position can be seen near the ankle, but this will resolve as the infant has full range of motion of the foot.

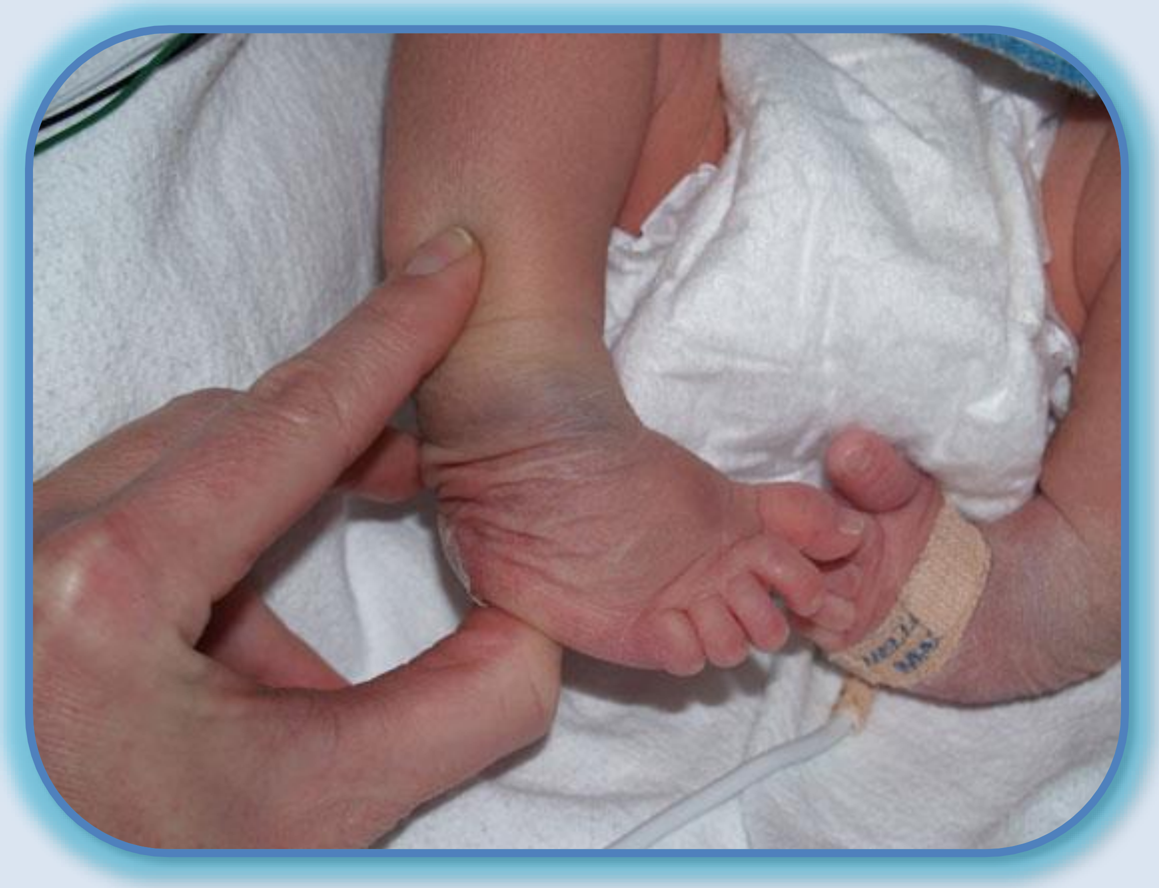
In some cases, **physical therapy** that involves stretching and range of motion exercises can help speed progress.

Club Feet



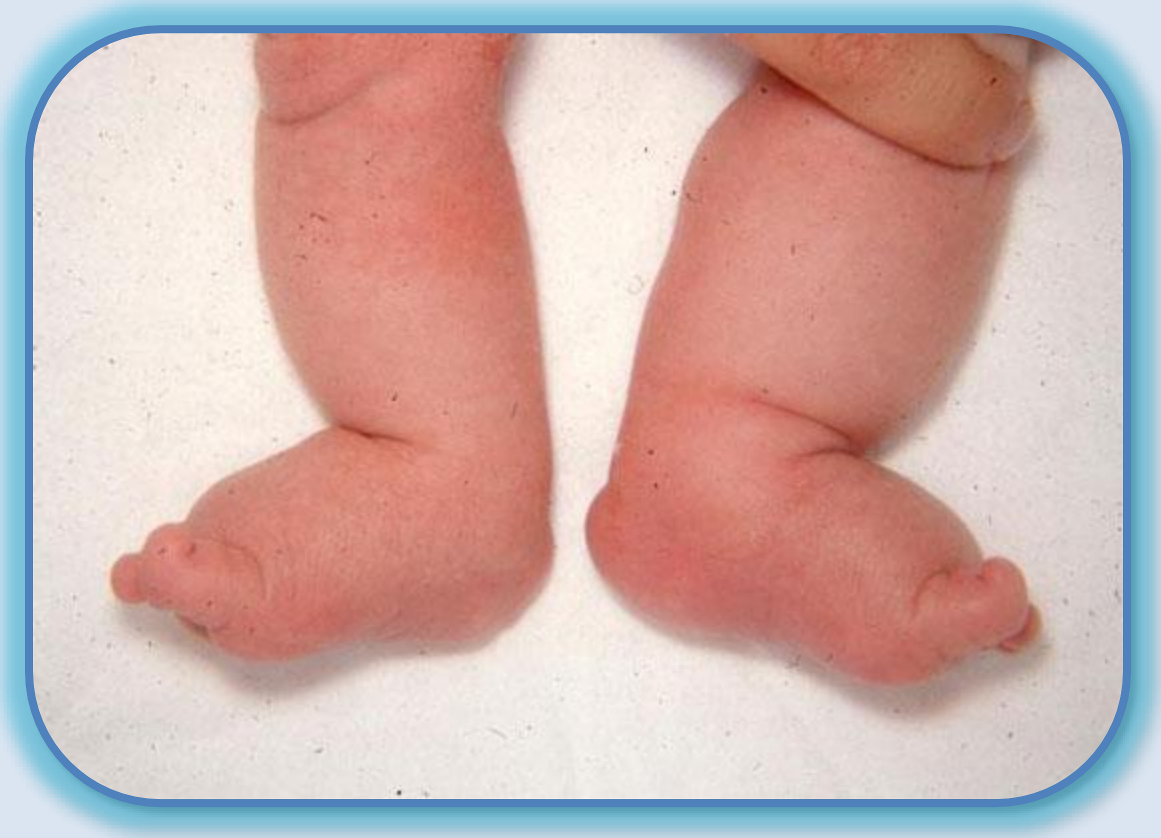
Bilateral club foot is noted in this infant. The **feet are plantar-flexed and inverted**. Because this is a **bony deformity**, this position is rigid.

Club Feet



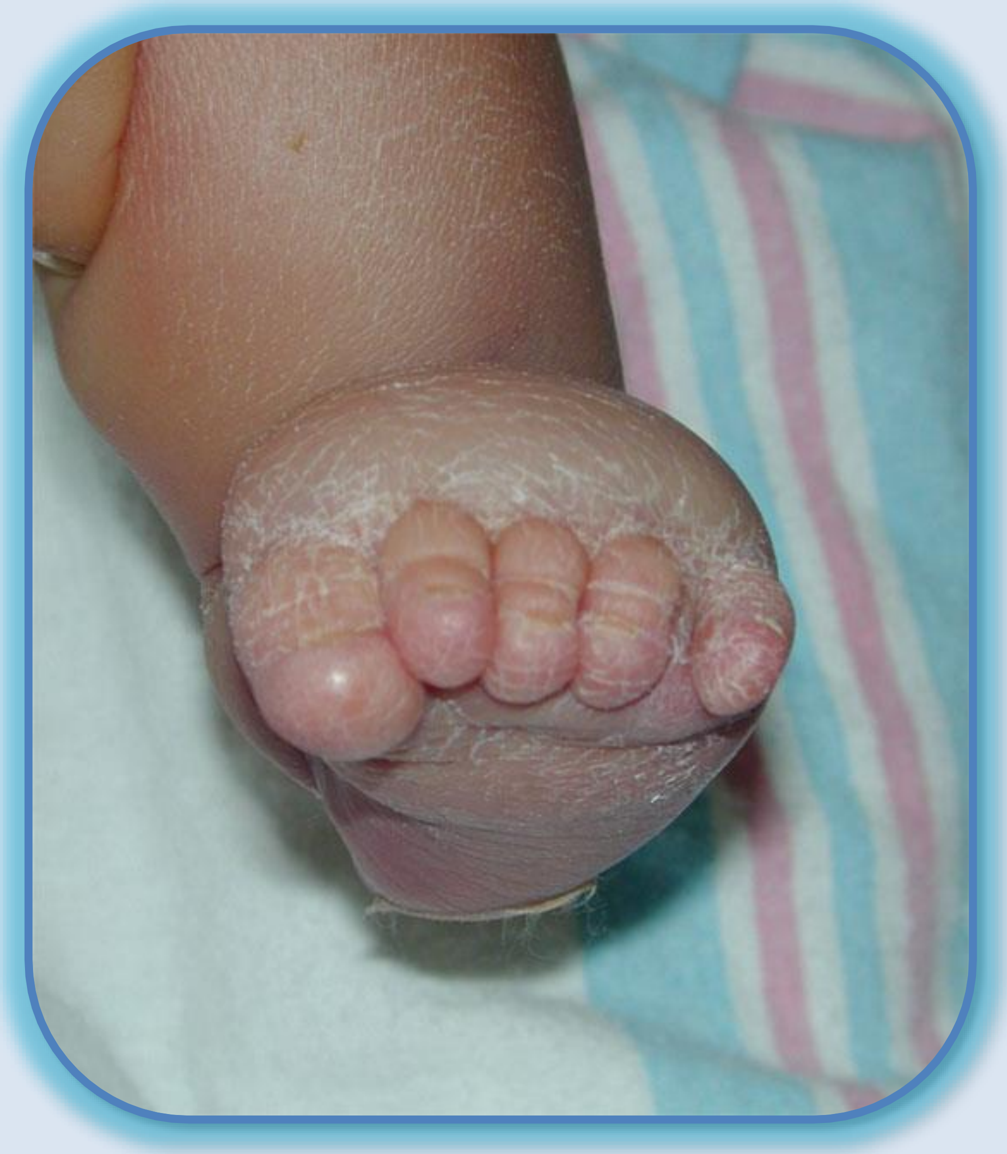
With an attempt to bring the foot to neutral position, the rigidity of the ankle is apparent. Although the skin is sliding and wrinkling, the actual position of the foot is not changed. The dark discoloration around the ankles are slate grey patches **(Mongolian spots)**, not bruises.

Edema of the Feet



In this infant, the feet and lower legs seem unusually puffy. Although edema in general has a long list of possible etiologies, **it is helpful to begin by determining if the edema is generalized or localized**. Edematous hands and feet in particular are known to be **associated with Turner's syndrome in infancy**, so this diagnosis should be considered **in girls** with this finding. In this case, Turner's syndrome was the underlying etiology.

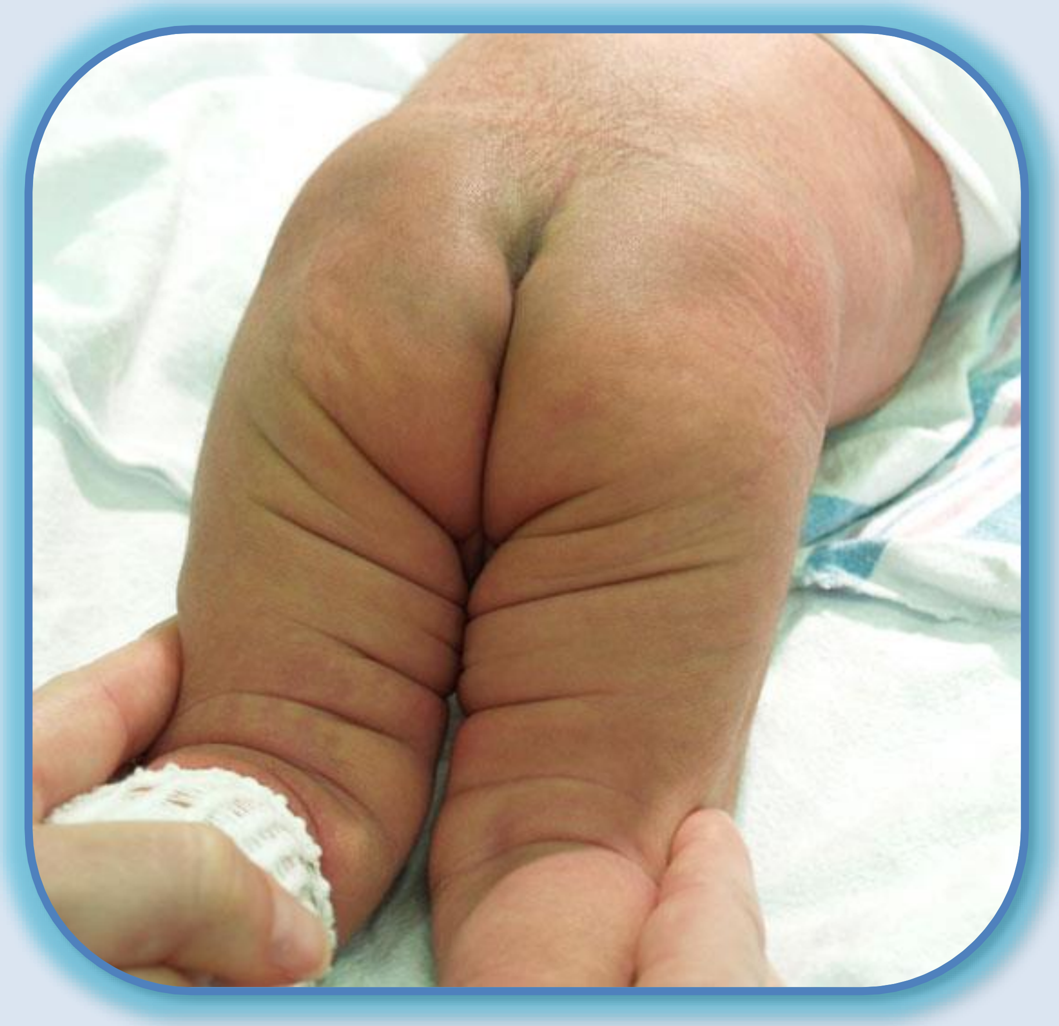
Edema of the Feet



Here is another baby with **edematous feet** as a result of **Turner's syndrome**. From this angle, the excessive puffiness behind the toes can be easily seen.

Hips

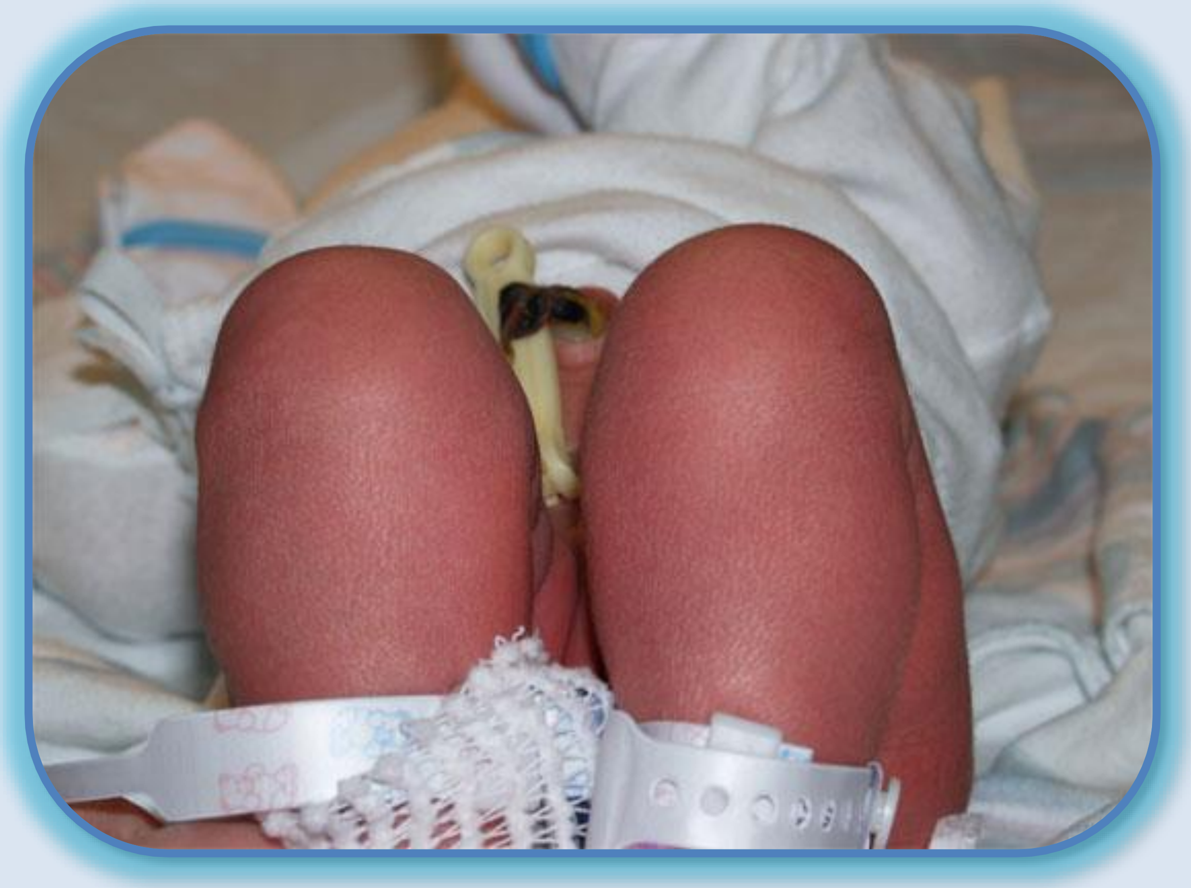
Leg Creases



Looking for asymmetry between the major creases in the thighs is **another way to evaluate for Developmental Dysplasia of the Hip**.

This infant appears to have some asymmetry of the most superior creases. Initially, some slight amount of subluxation was felt on the **Barlow exam** in this baby. This finding is more useful in older children as **25% of infants with normal hip exams may also have asymmetric creases**.

Galeazzi Sign



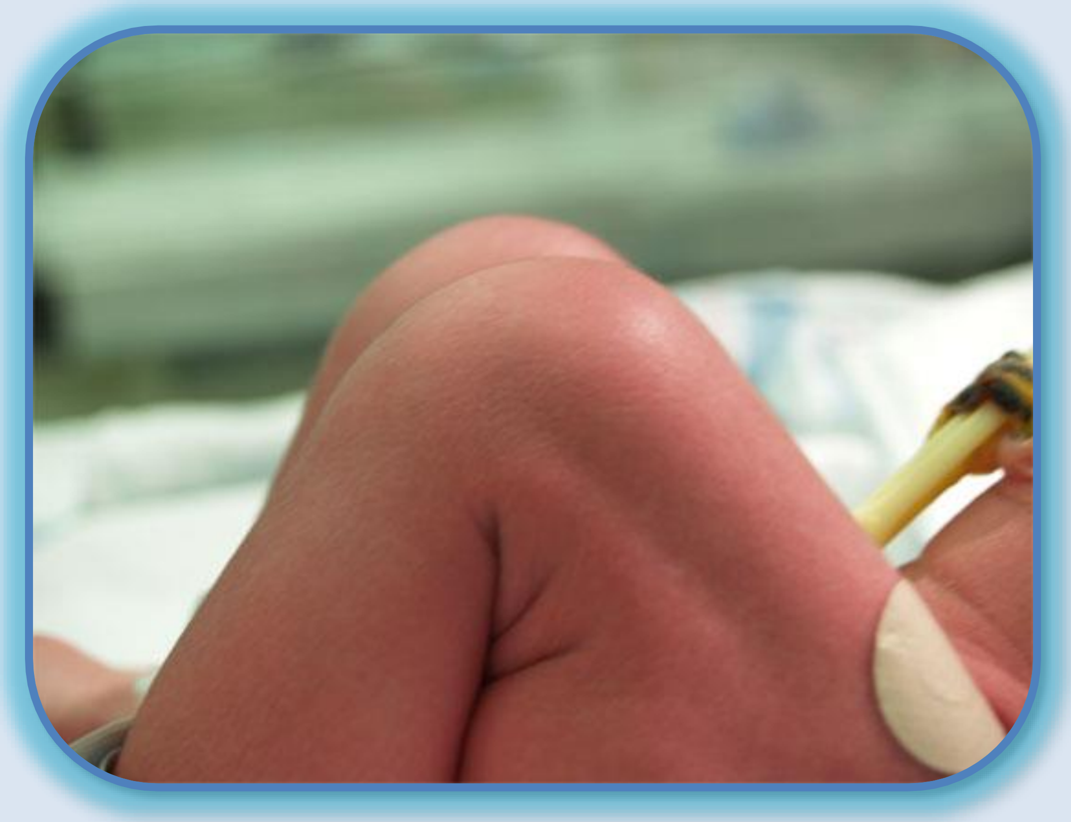
Hips can also be assessed by **looking at the symmetry of the height of the knees when the infant is supine**.

A **positive** galeazzi sign (**unequal** knee heights) suggests a unilaterally dislocated hip.

It is important to remember that bilateral dislocations will likely appear symmetric, so this assessment should only be used in combination with the Ortolani and Barlow maneuvers.

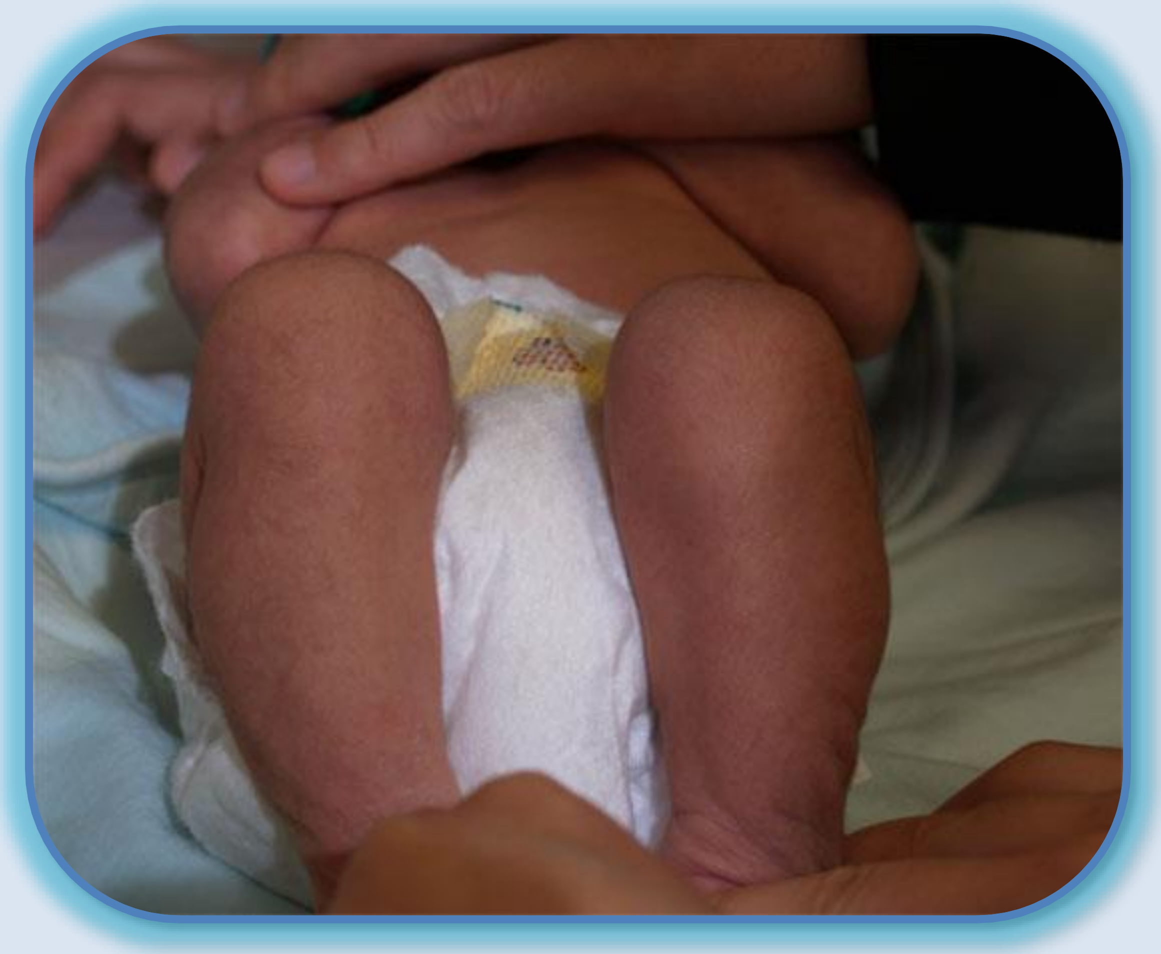
The infant in this photo has a **negative** galeazzi sign (the hips are **normal**).

Galeazzi Sign cont...



With a **side few** of the same infant in the previous photo, the knees still appear **symmetric**. Again, this is a **negative** Galeazzi.

Positive Galeazzi Sign

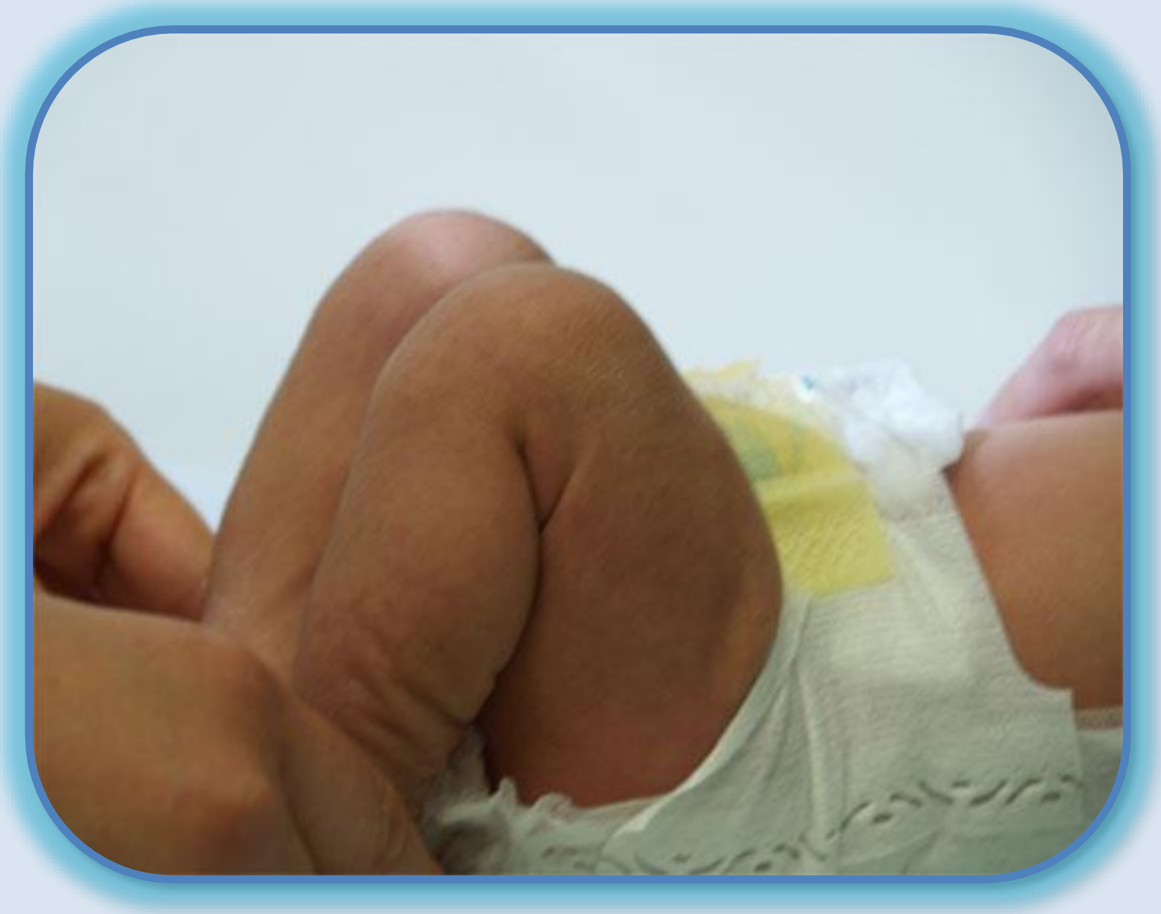


In contrast, this infant has a **positive** Galeazzi sign.

With both feet placed firmly on the table, the knees are **not symmetric**. This finding is usually caused by a **dislocated femoral head** which is situated posterior to the acetabulum, instead of in the acetabular fossa. This creates a shortened appearance of the thigh on the affected side.

In this case, the left hip was the abnormal one.

Positive Galeazzi Sign cont..

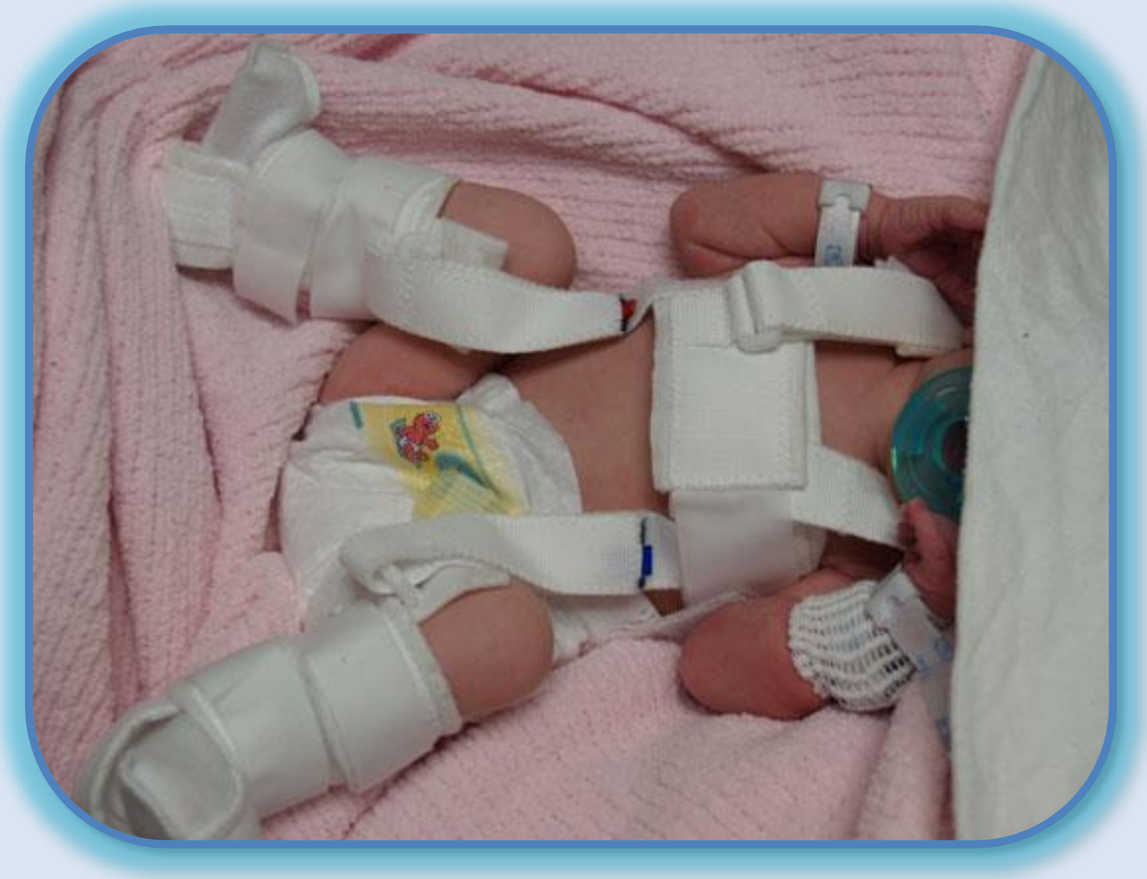


This is the side view of the same infant as in the previous photo.

Again, the left knee is slightly lower than the right (although in this view the difference seems less pronounced).

This infant was treated with a **Pavlik harness** and did well.

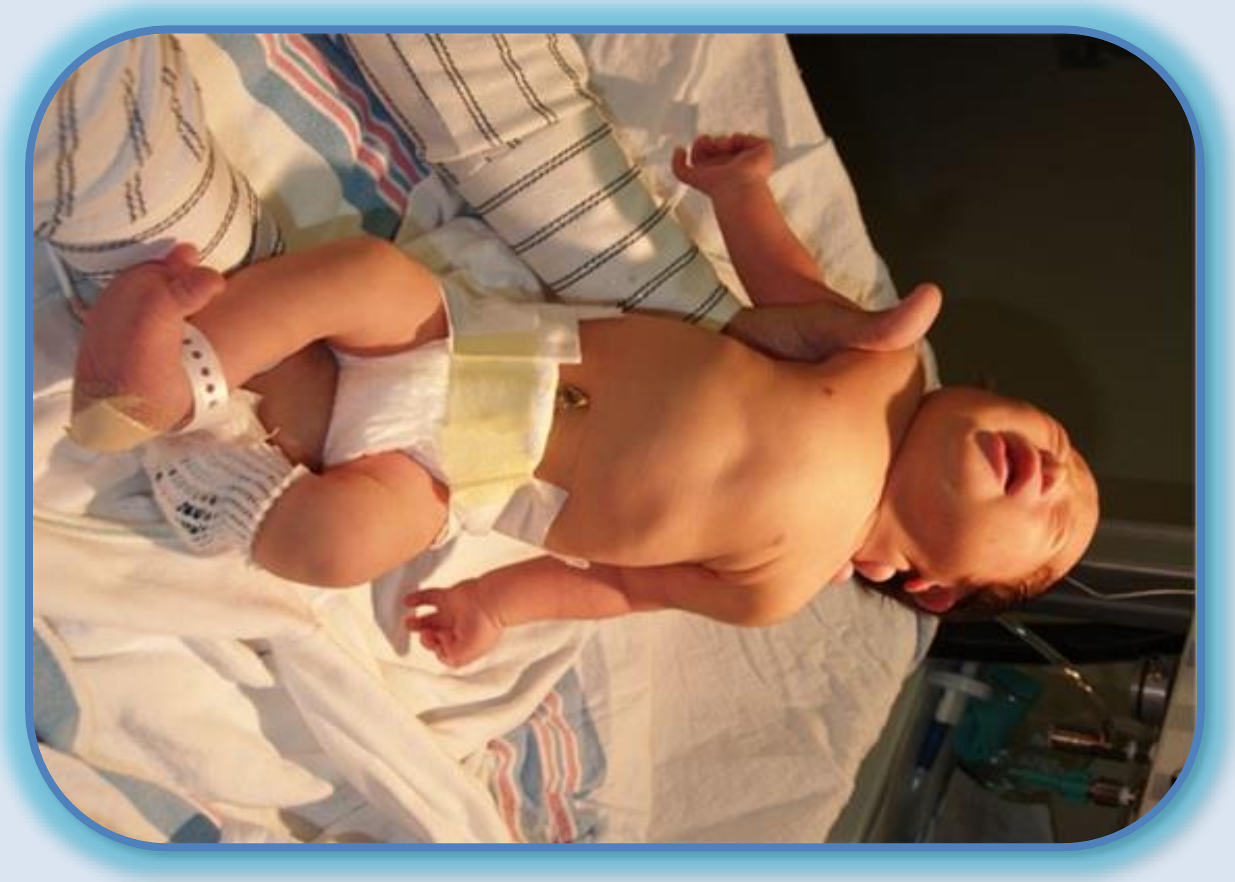
Pavlik Harness



When instability of one or both hips is noted, an orthopedic consult should be obtained. In many cases, a Pavlik harness will be placed before the infant is discharged from the hospital. While it is a Velcro apparatus and can be easily removed, the family is frequently instructed **not to remove** it for some time, so care should be taken to ensure that all newborn bands are removed from the ankles first.

Neuro

Hypotonia

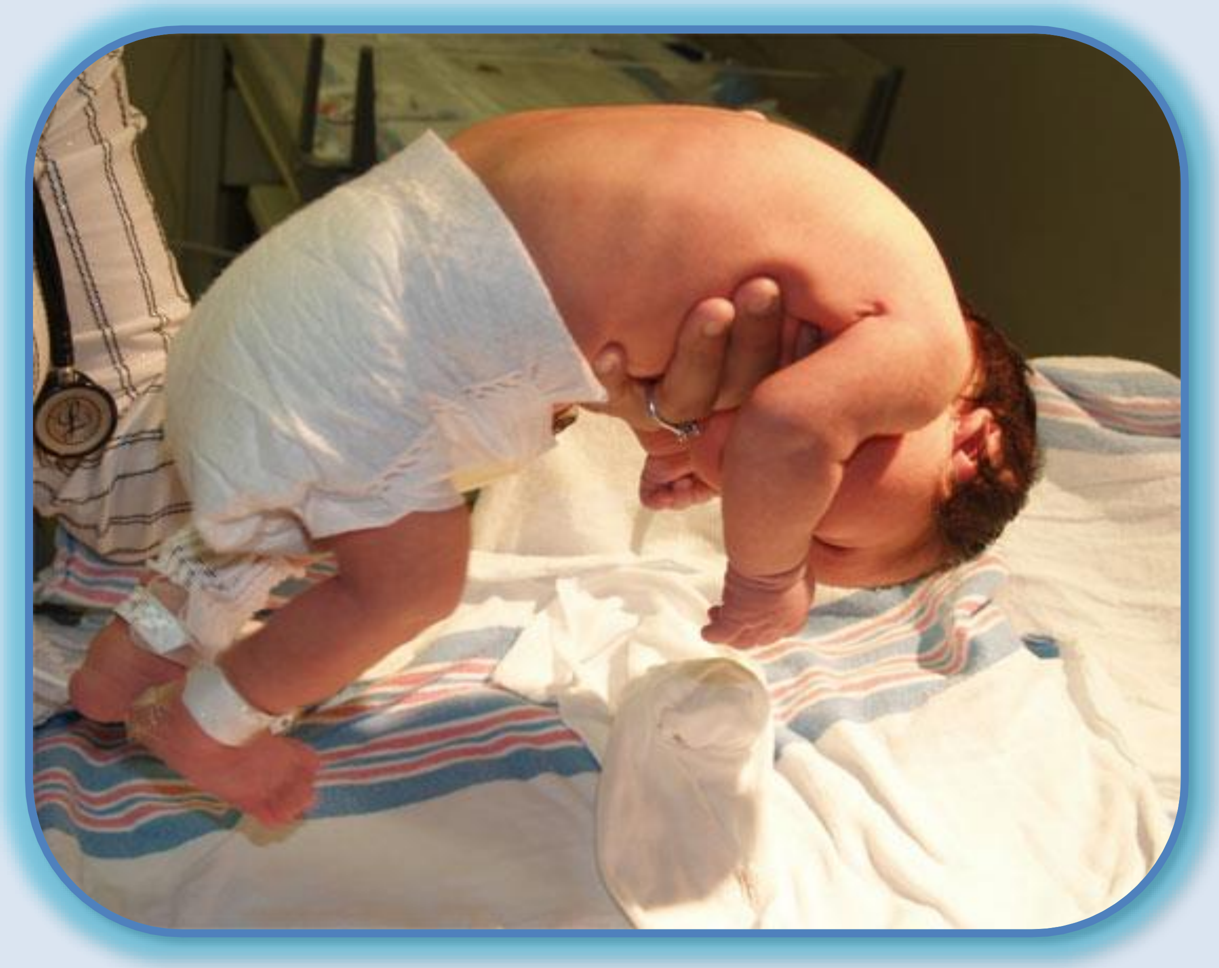


The assessment of tone can be made both from **observing the posture and activity** of the infant when undisturbed and also by handling the baby.

Infants with normal tone will not feel **"floppy"** when held by the examiner.

The infant in the photo above is hypotonic. When this baby was lifted, the examiner had to give much more support to the head and shoulders than is usual to keep the infant from sliding from her hands. Notice how both arms fall back (instead of being held in flexion), and the baby's chest seems to drape over the physician's hand.

Hypotonia

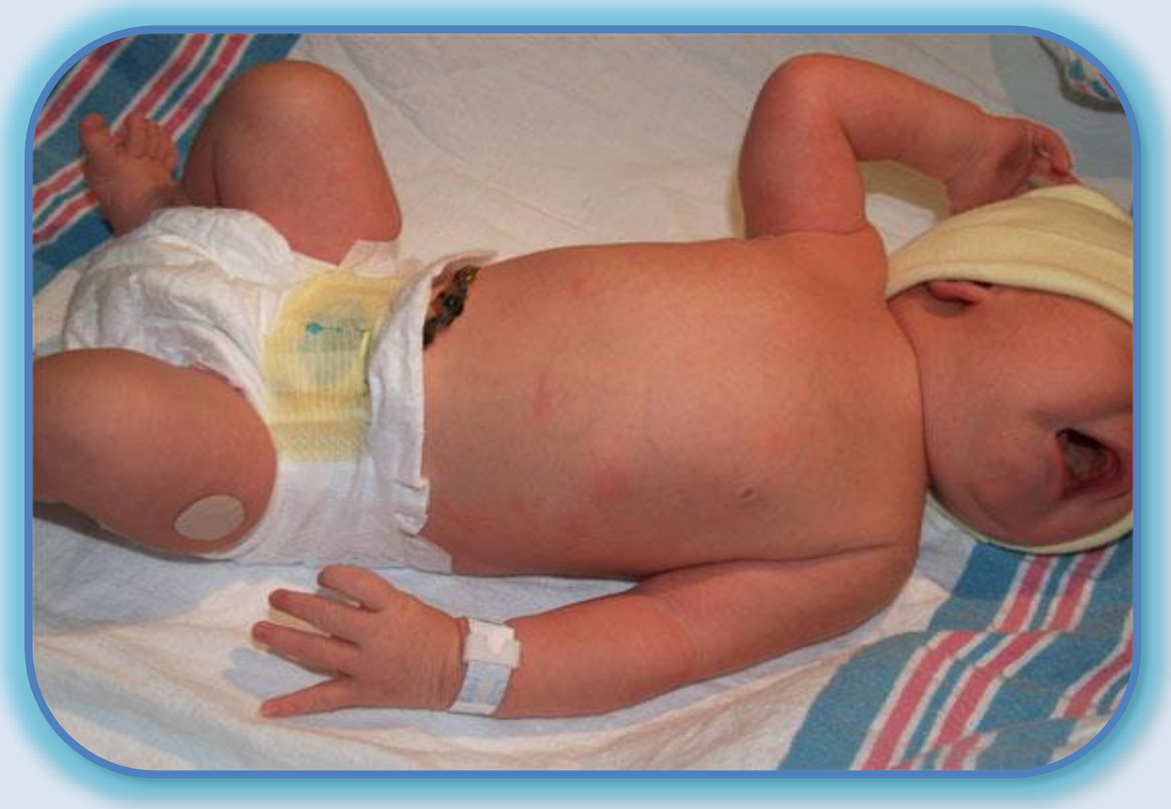


Here is the same infant held in **ventral suspension**.

Normally newborns do have a convex curvature of the spine in this position, **but not to this degree**. Here the **head drops** much lower than one would expect, and the examiner has the sense that the infant could **easily slip out** of her hand without extra support.

In this case, the hypotonia was caused by trisomy 21.

Erb's Palsy



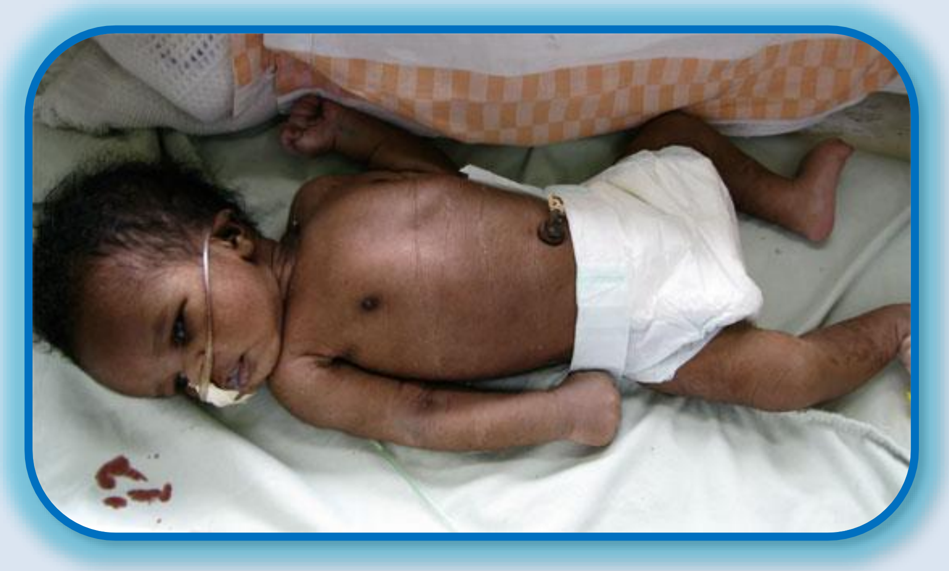
When **shoulder dystocia** occurs during the birth, injury to the **brachial plexus** can occur.

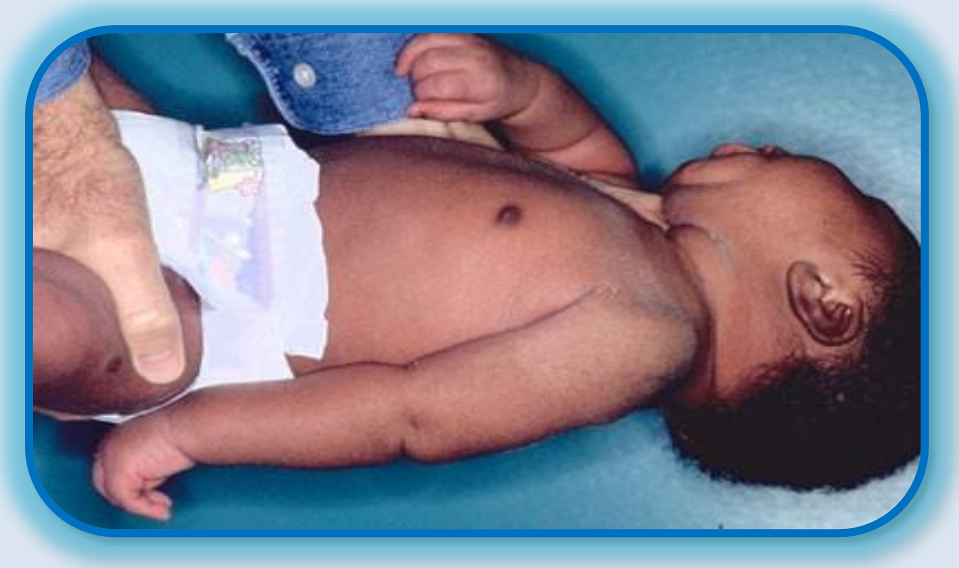
This photo shows how the **posture of the arms is asymmetric**: the left arm is at the side and the hand is medially rotated at a time when the other arm is flexed with crying.

Testing the **Moro (startle) reflex** in this infant produces a similar result as the left arm does not raise as high as the right.

Most brachial plexus injuries of this type **resolve** spontaneously. Improvement in movement can often be noted within the first 24 hours. **If** improvement does not occur, referral to a pediatric neurologist, and possibly a physical therapist, is warranted.

Erb's Palsy

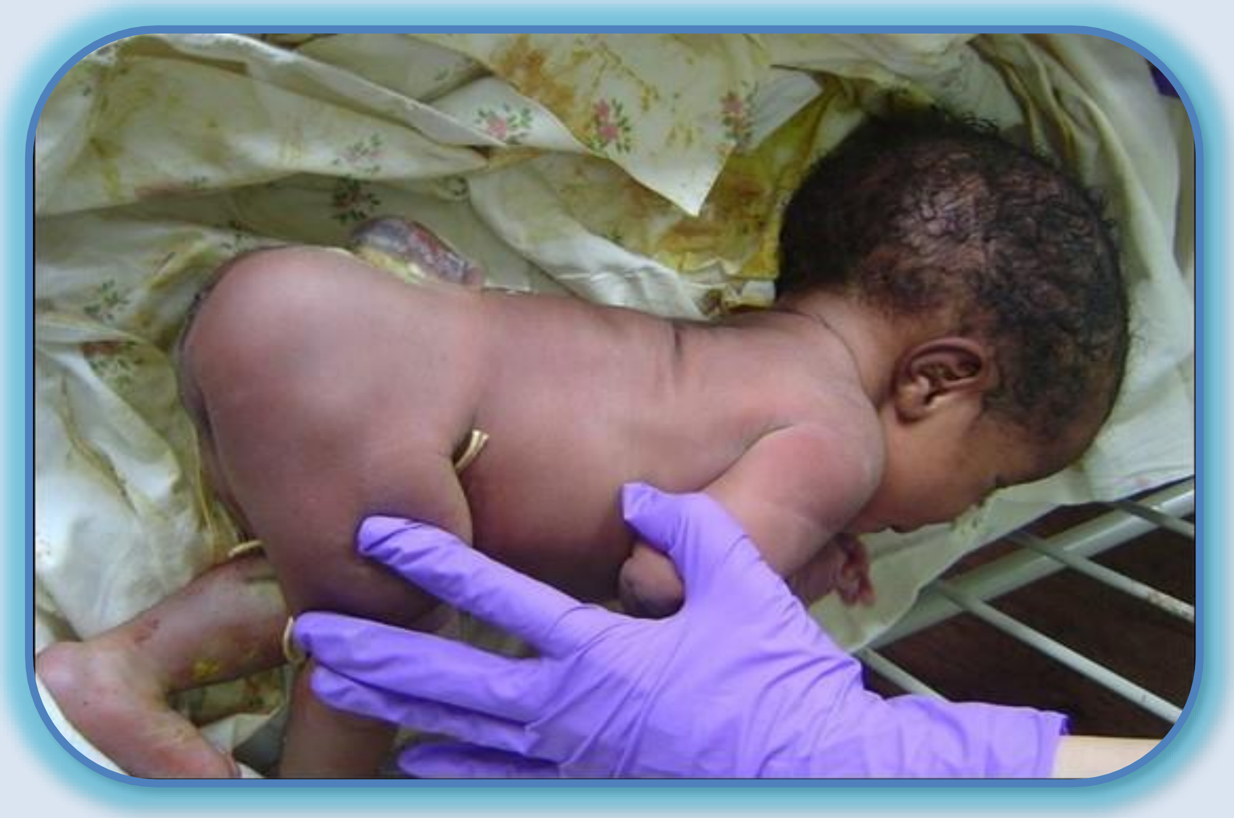




This is another example of Erb's palsy.

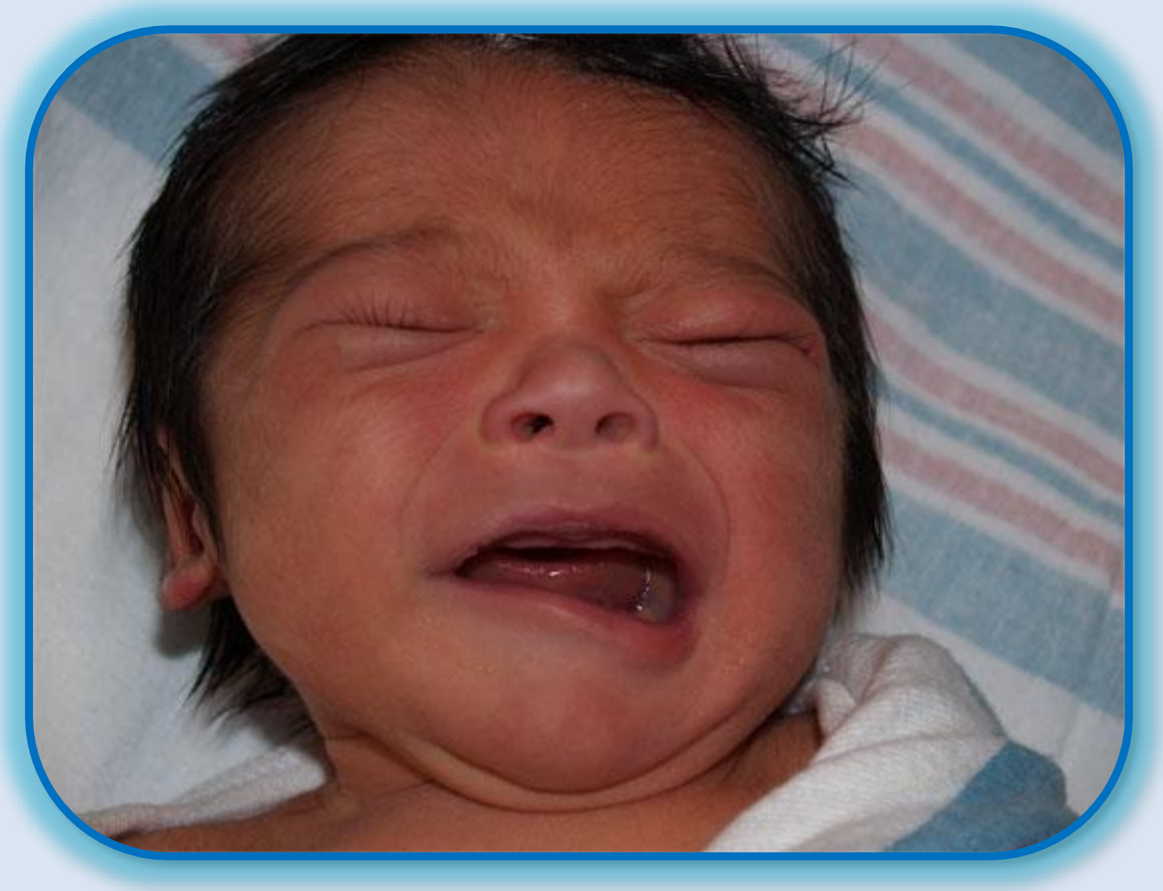
In this case, the infant's right arm is affected. When assessing movement of the extremity, look for movement, function, and strength of all three major joints (shoulder, elbow and wrist) as well as the hand grasp.

Meningomyelocele



It is a type of neural tube defect that results from incomplete closure of the posterior spine during early development. The visible mass contains dysplastic spinal cord as well as meninges, nerve roots, and CSF. The **lumbar spine is the most common** location for this abnormality. When this diagnosis is made prenatally, caesarian section is usually recommended, and the birth is planned at a location where a pediatric neurosurgeon and level 3 NICU are available. At delivery, the defect can be protected with sterile saline-soaked gauze, covered by plastic wrap, and the infant kept in a side-lying or prone position. Infants with this condition frequently have **associated abnormalities**; **Arnold Chiari malformation**, dislocated hips, bowel or bladder dysfunction, and lower extremity weakness are all common co-morbidities.

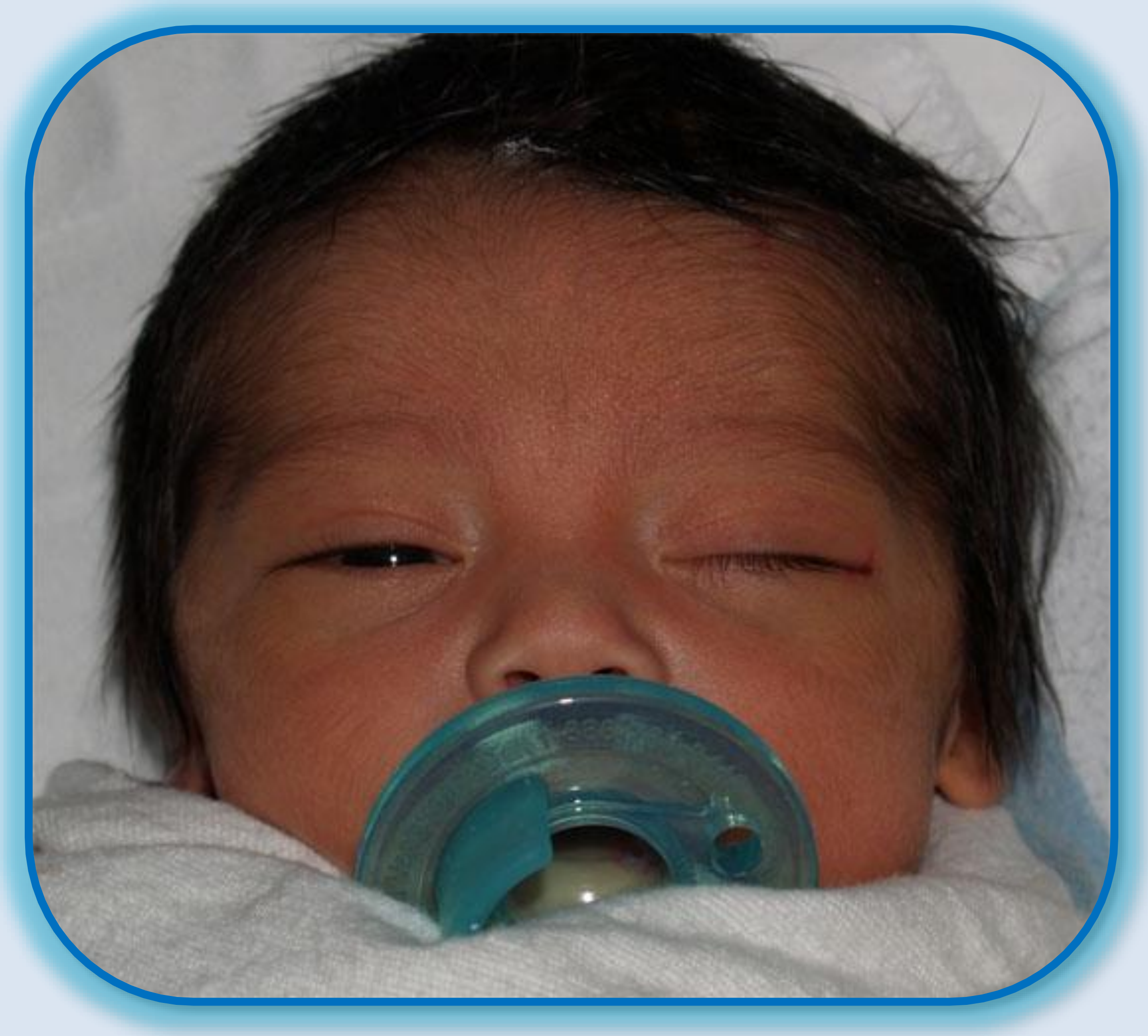
Facial Nerve Palsy



This newborn was delivered by **forceps** assisted vaginal delivery. There were small abrasions present on the left lateral eyelid and anterior to the right ear. The right facial nerve is affected here.

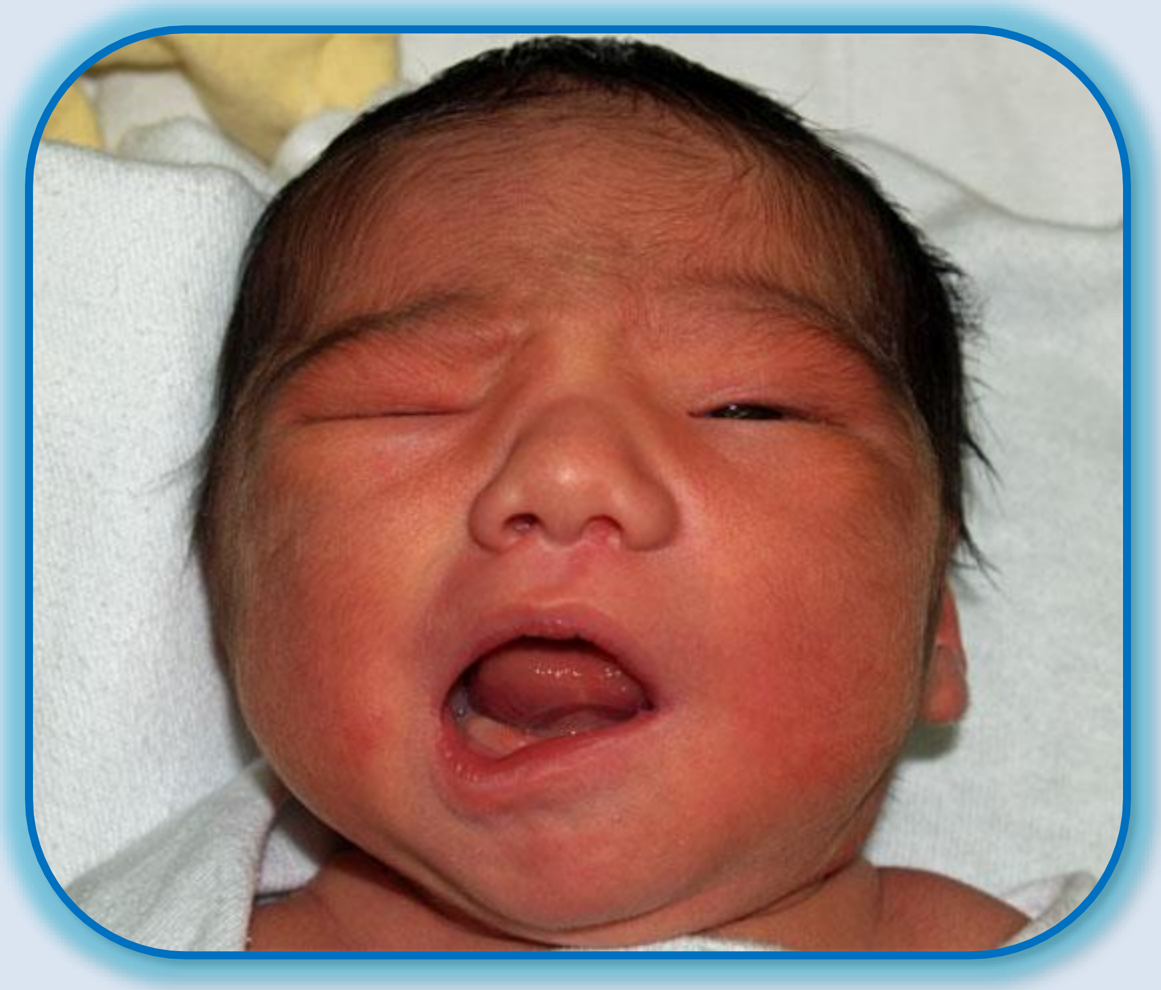
In an infant who is **crying**, the lower lip should be pulled down by the action of the facial nerve, but in this baby, the lip is pulled down only on the left and an **asymmetry** results. **Spontaneous resolution** is expected.

Facial Nerve Palsy



When the baby is quiet, asymmetry in eyelid closing can more easily be seen. As the baby was resting, so both lids should have been closed. Instead, the lid on the affected side (Right) is partially open. Involvement of both the eye and lip help differentiate facial palsy from other diagnosis, such as asymmetric crying facies.

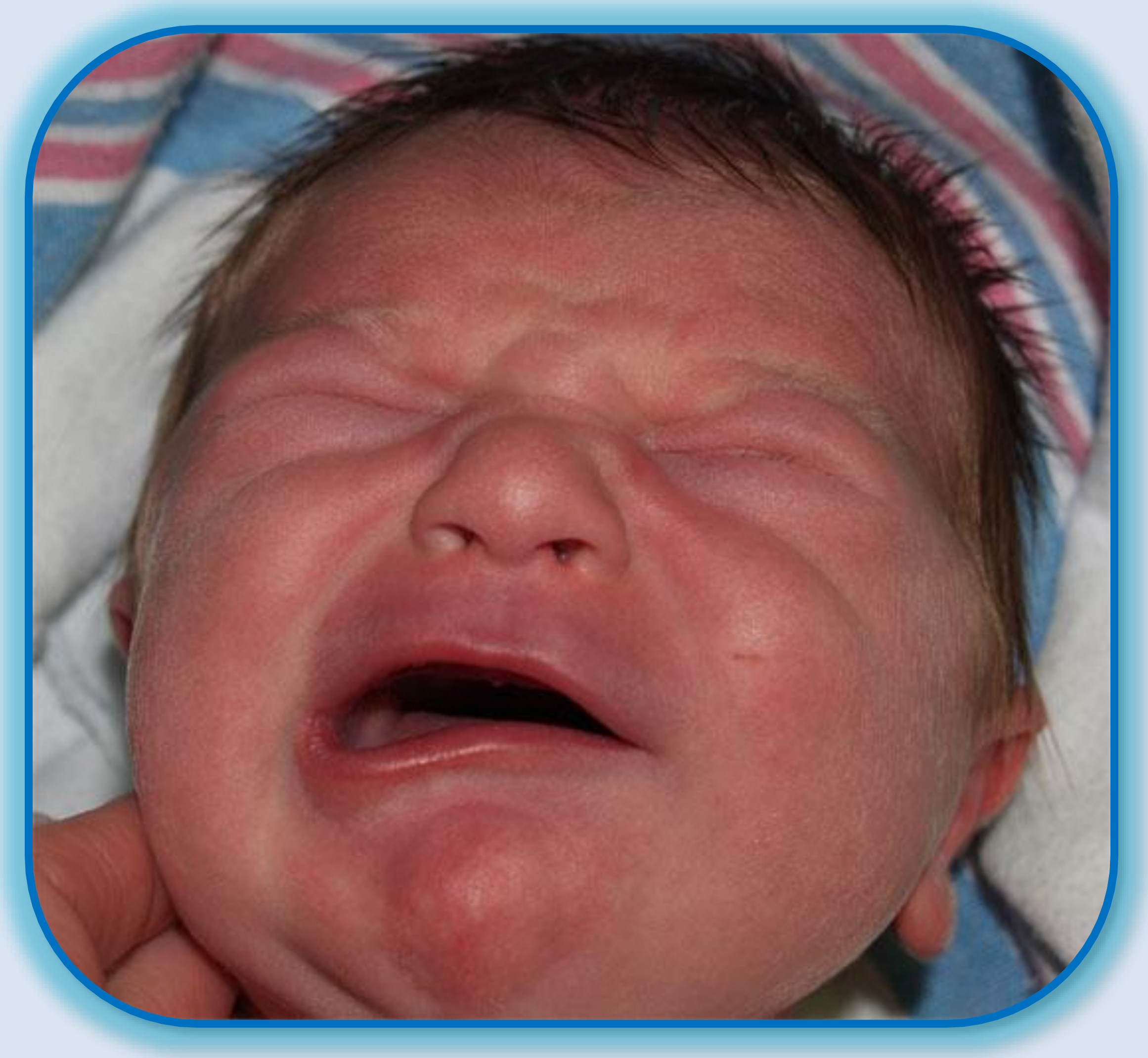
Facial Nerve Palsy



This infant has left facial nerve palsy. Here, both the abnormal lip and eyelid positions can be seen.

When the eyelid does not completely close, it is important to **protect the eye** with a lubricant to prevent corneal abrasions.

Asymmetric Crying Facies

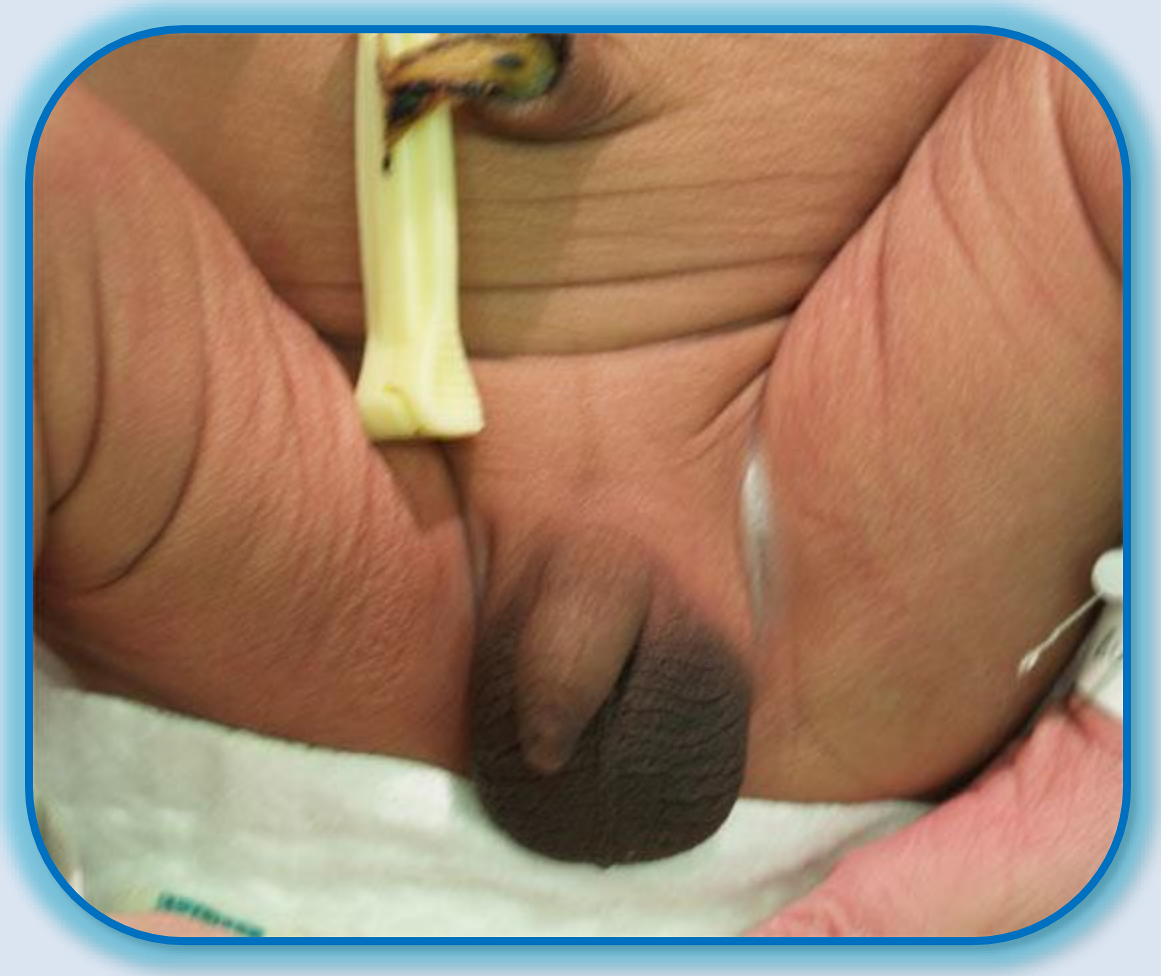


This infant has asymmetric crying facies. This condition can be differentiated from facial nerve palsy in that the eye and forehead muscles are unaffected. The etiology is a congenital deficiency or absence of the depressor anguli oris muscle which controls the downward motion of the lip. In this patient, the left side is affected.

In rare cases, this anomaly has been associated with cardiac or renal abnormalities or 22q11 deletion, so a careful examination is warranted.

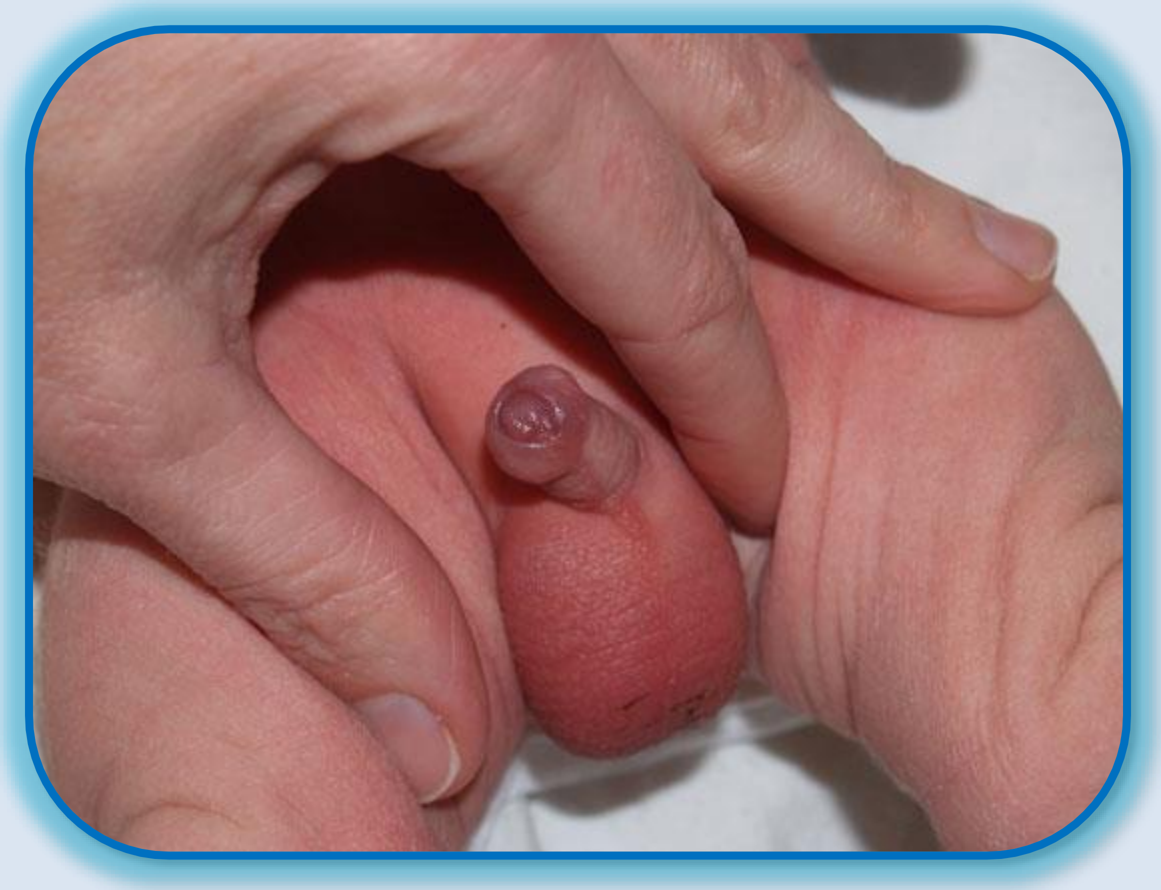
Genitourinary

Normal Male Genitalia



Normal male genitalia in a term infant. The amount of pigment in the scrotum can vary considerably, depending on the ethnicity of the parents and maternal hormone effects.

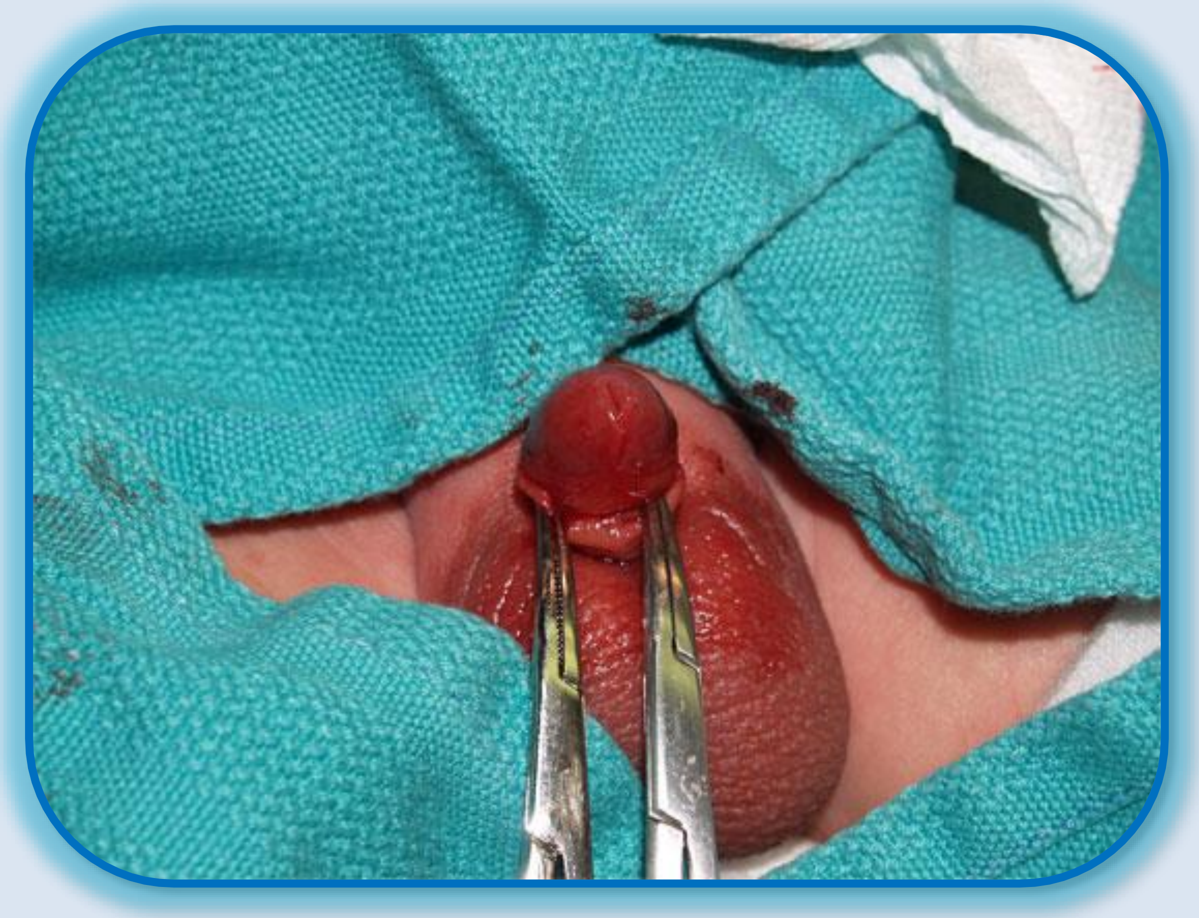
Foreskin Variant



Although the opening of the **foreskin is usually tight** enough in the newborn to preclude a view of the urethra, variability exists.

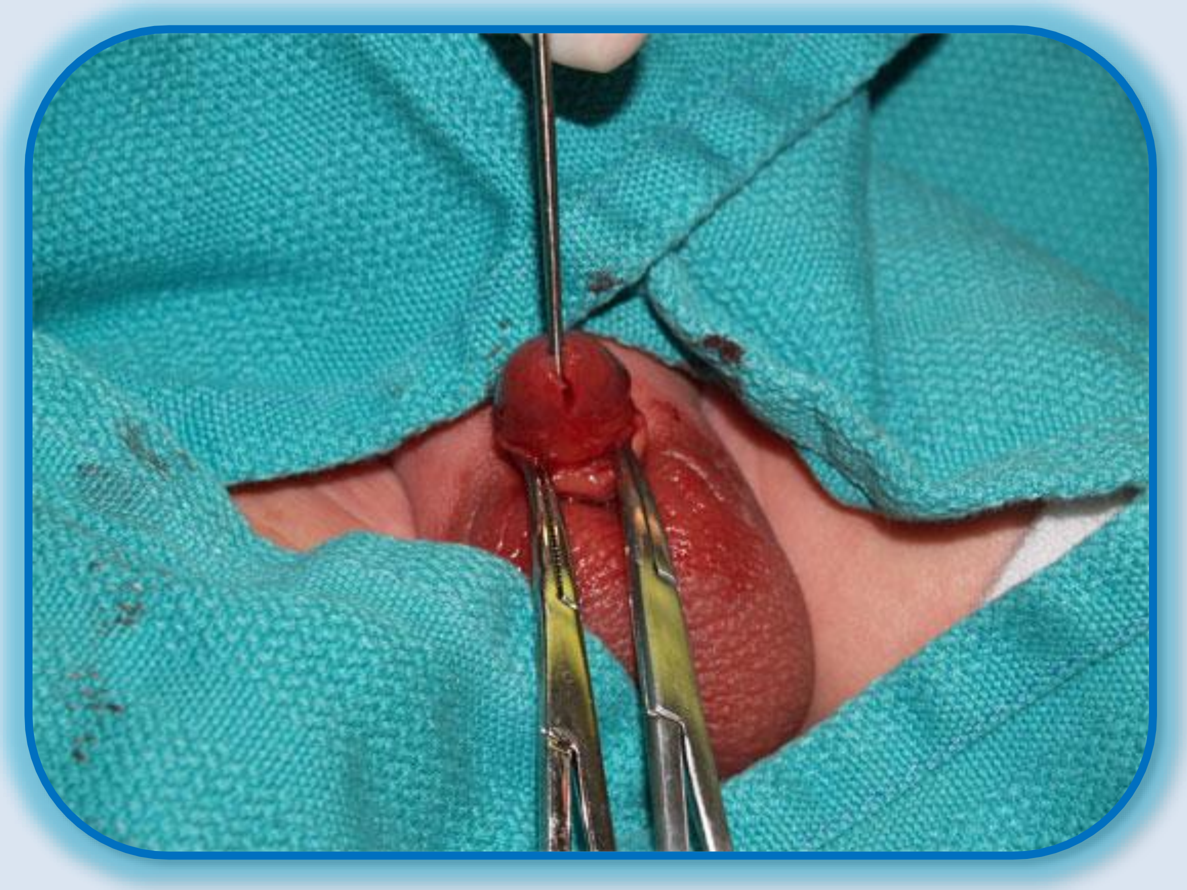
In this infant, a normal urethral meatus can be clearly seen through the wide opening of the foreskin. This is a variation of normal & no referral or intervention is necessary.

Megameatus



After retracting the skin for a circumcision, this anomaly of the meatus was noted. Although the meatus starts in a normal distal position, it extends down the ventral surface of the glans all the way to the corona. This is a **variant of hypospadias**, **but it occurs with a normal foreskin**.

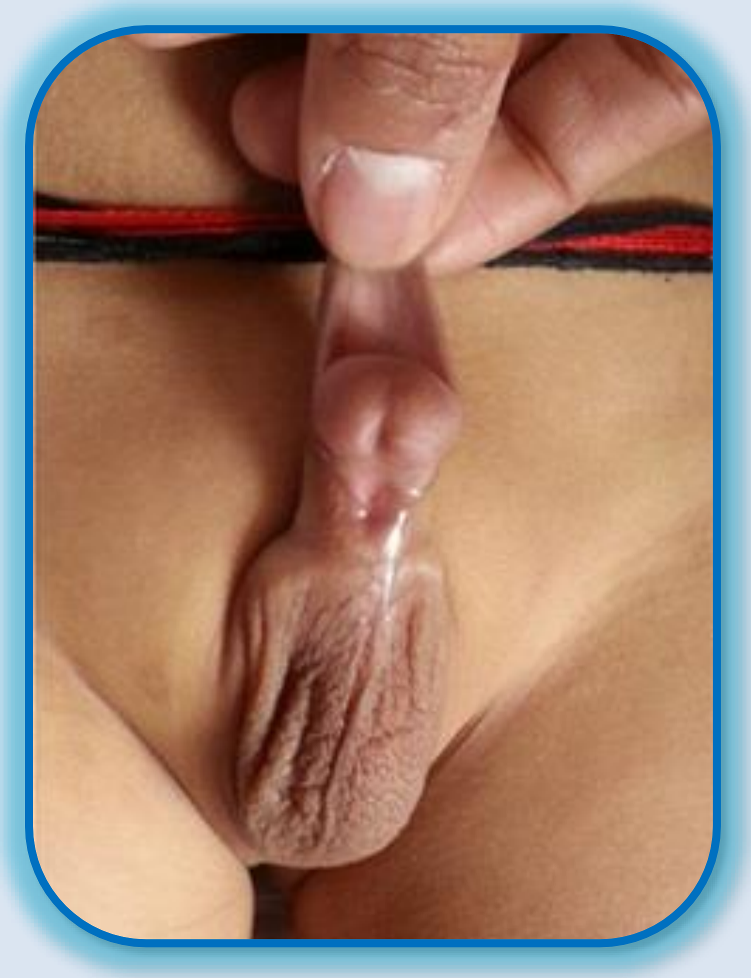
Megameatus



With use of a probe, the extent of the meatus can be more clearly seen. **Circumcision is not contraindicated in this case**.

There is **no functional problem** with this abnormality in the newborn period; **repairs** are usually planned when the infant is **several months old**, as the risk of general anesthesia is less at that age.

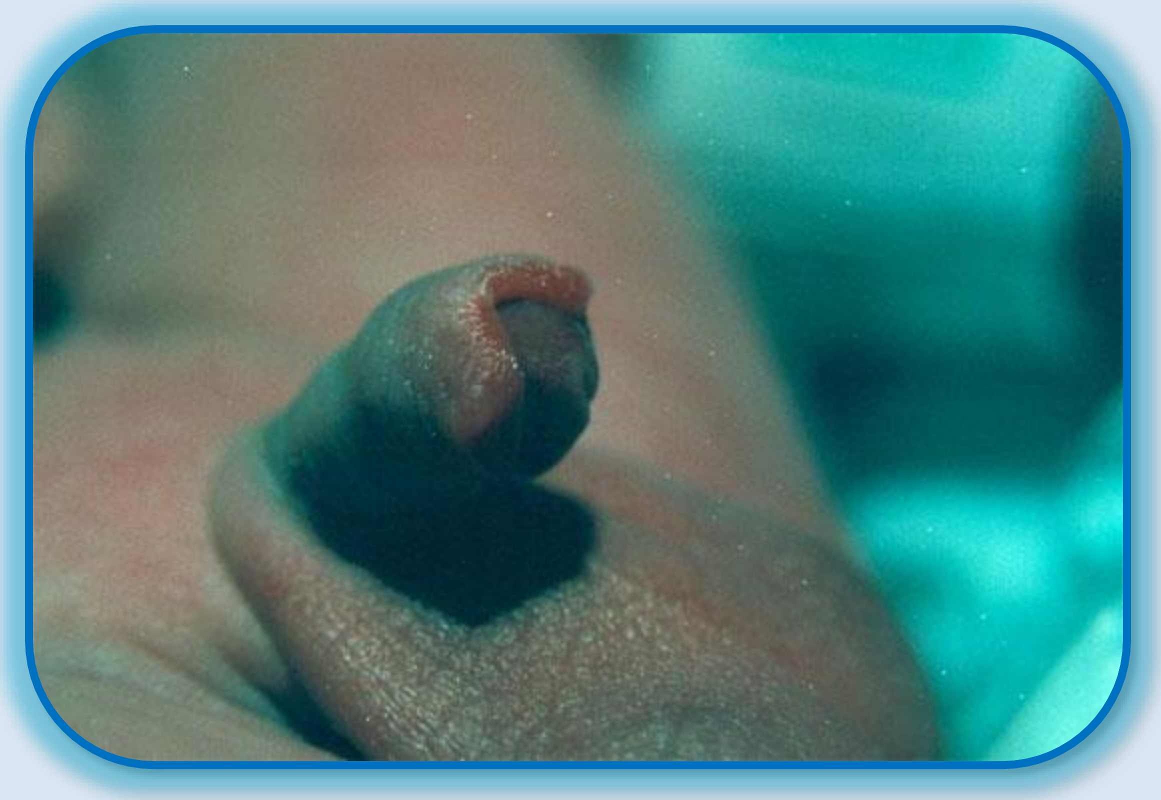
Hypospadias



Hypospadias with **opening of the urethra on the distal penile shaft**. Though not easily visible in this photograph, the urethral meatus is about midway between the normal location and the insertion into the scrotum. A **hooded foreskin**, which allows the glans to be readily visible, is present. The term **"natural circumcision"** sometimes used, is a misnomer. The foreskin is present,(just malformed).

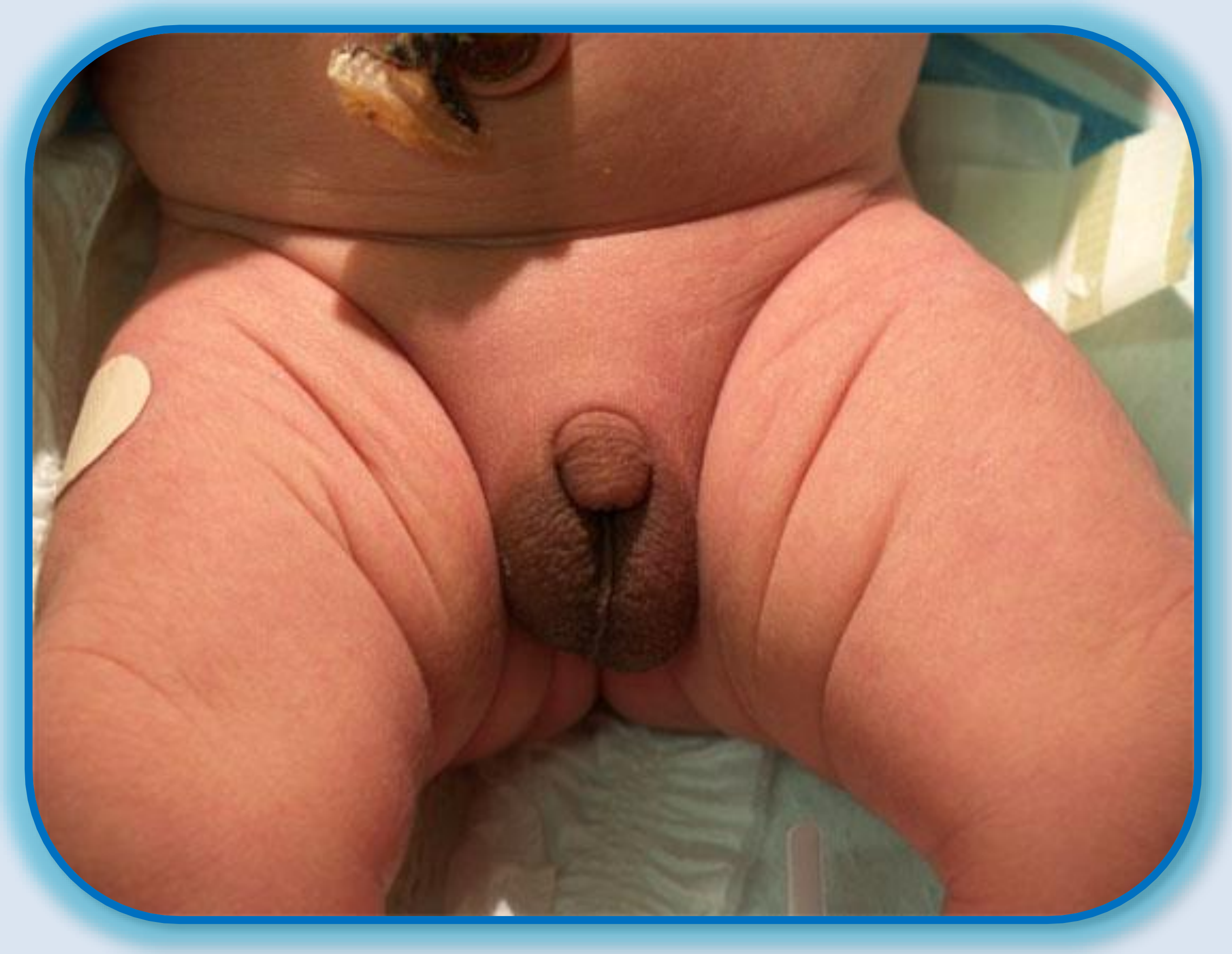
Hypospadias **affects 1:250 boys**, but most have a milder form than that shown here.

Hypospadias



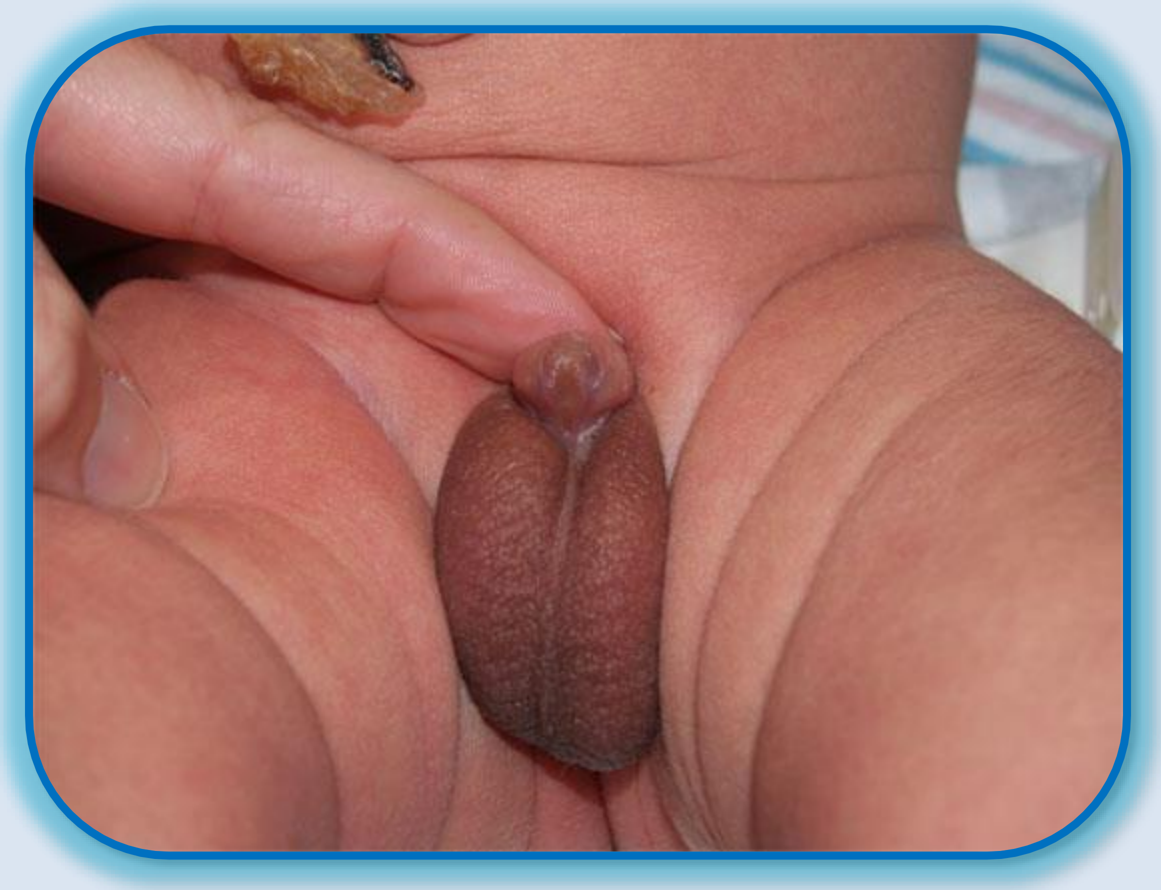
This is another example of hypospadias. Here, the **hooded foreskin** can be readily appreciated. The **urethral meatus** is visible in a slightly more **ventral position** than is normal. This is a **less severe degree** of hypospadias, **but still presents a contraindication to circumcision**.

Hypospadias



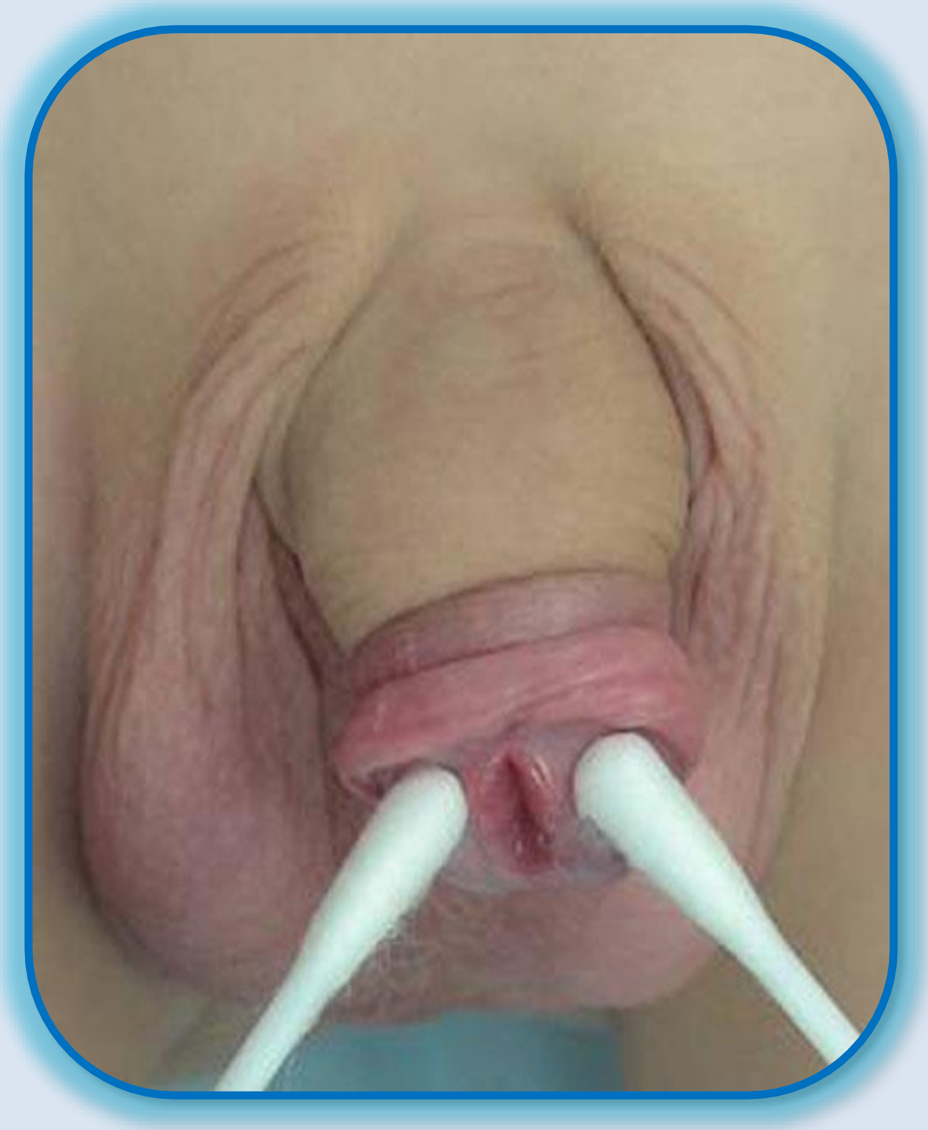
In this patient, hypospadias is not readily apparent at first look, although the phallus does appear somewhat short for a full-term infant. The following photo demonstrates the abnormality more clearly.

Hypospadias



Here, slight pressure was applied on the dorsal edge of the base of the penile shaft to tip the phallus up. With this view, one can see that the ventral surface of the shaft seems to be largely absent and that the urethral opening appears to lie in the very short distance between the scrotum and the foreskin bulges on the sides of the glans.

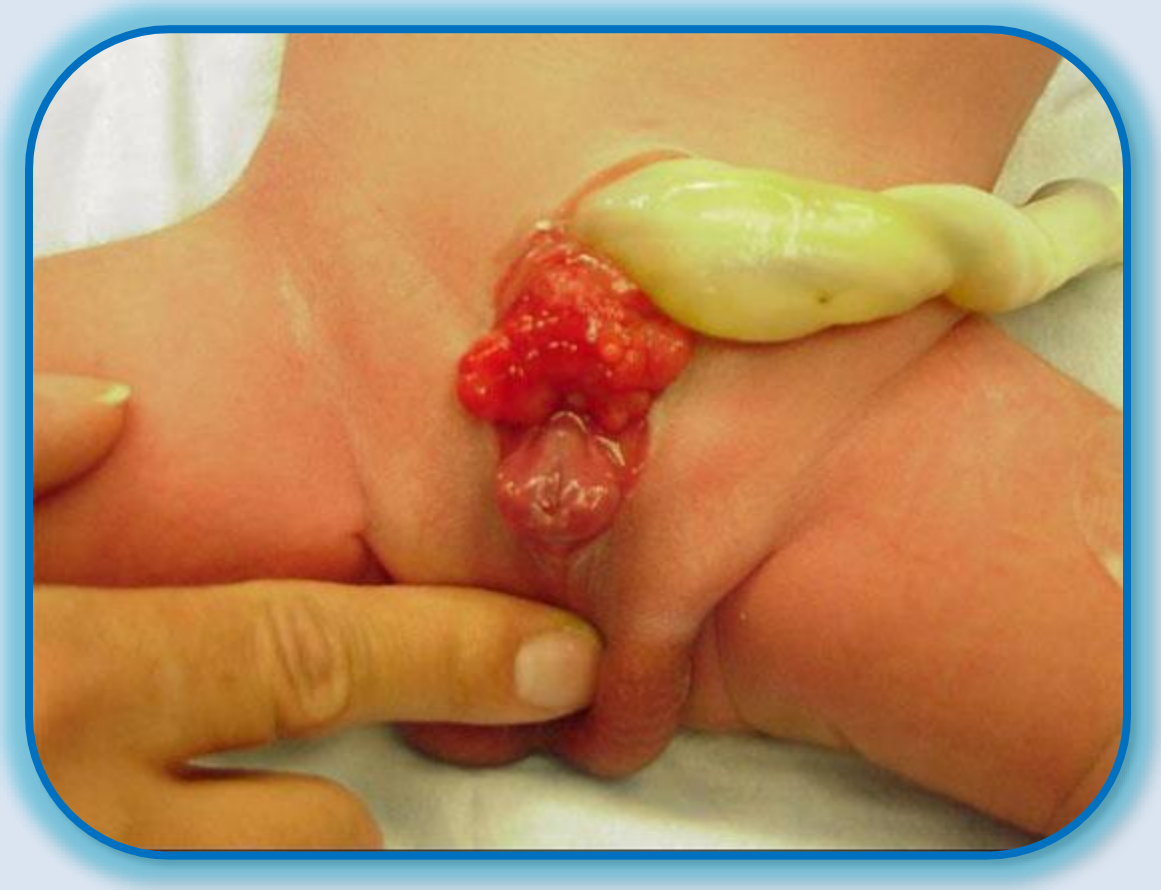
Epispadias



With epispadias, the **urethral meatus is** **dorsally** **displaced**. This condition is **much less common than hypospadias**, but **also presents a contraindication to routine circumcision**.

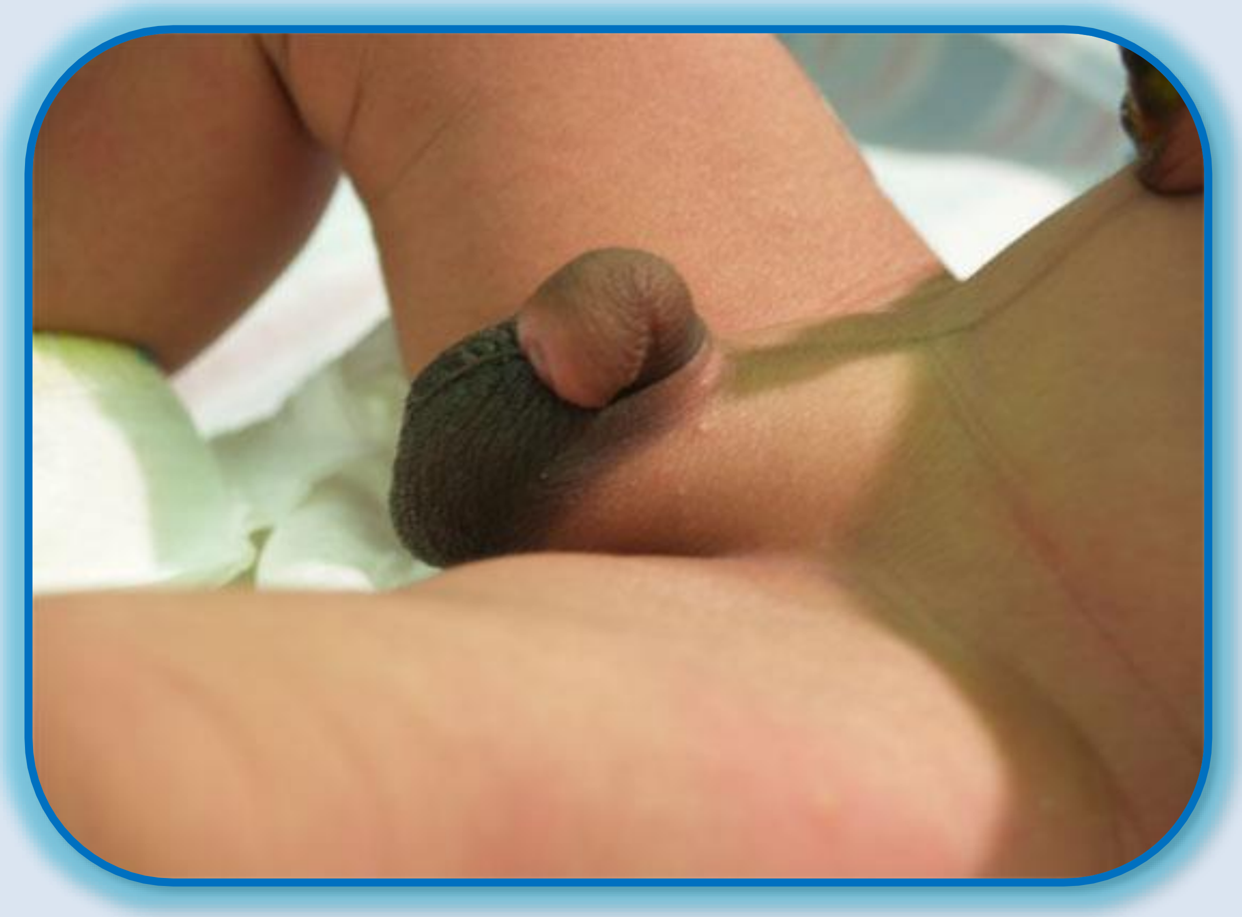
In its severe forms, epispadias is often associated with **exstrophy of the bladder**.

Epispadias



This is an example of **severe epispadias** and **bladder exstrophy**. The penis appears to be nearly completely splayed open lengthwise on the dorsal surface, and actually has a dorsal curvature which is minimized by the downward pressure applied to the scrotum. The red tissue inferior to the umbilical cord is the inner (posterior) wall of the bladder which is also splayed apart and protruding through a defect in the anterior pelvic wall. **Surgical correction is required**.

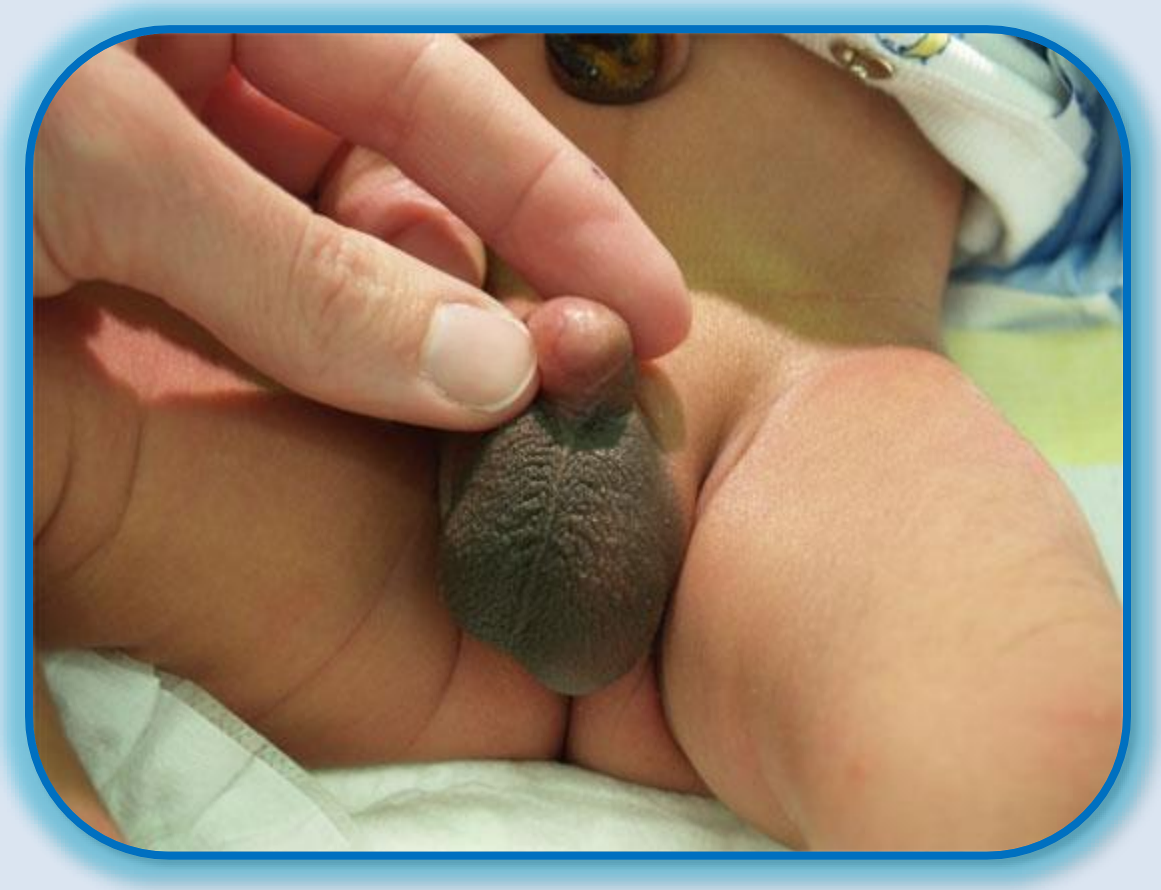
Chordee



Chordee exists when there is a **ventral curvature of the penis**. It can occur in the setting of hypospadias, but **can also be isolated**.

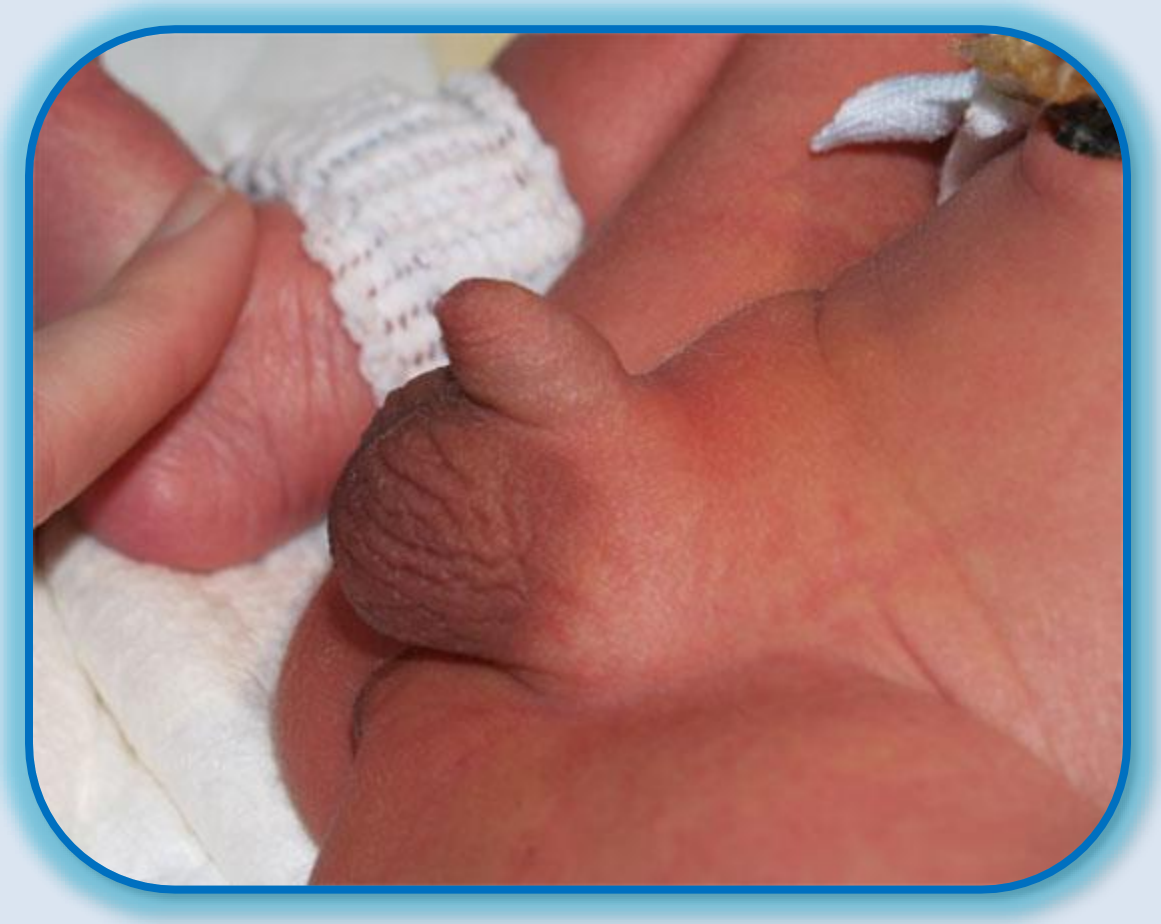
In this baby, the curvature is most visible from this view from the side. **Chordee is a contraindication to circumcision** in the newborn period, but if desired, circumcision **can be done at the time of surgical correction**.

Chordee



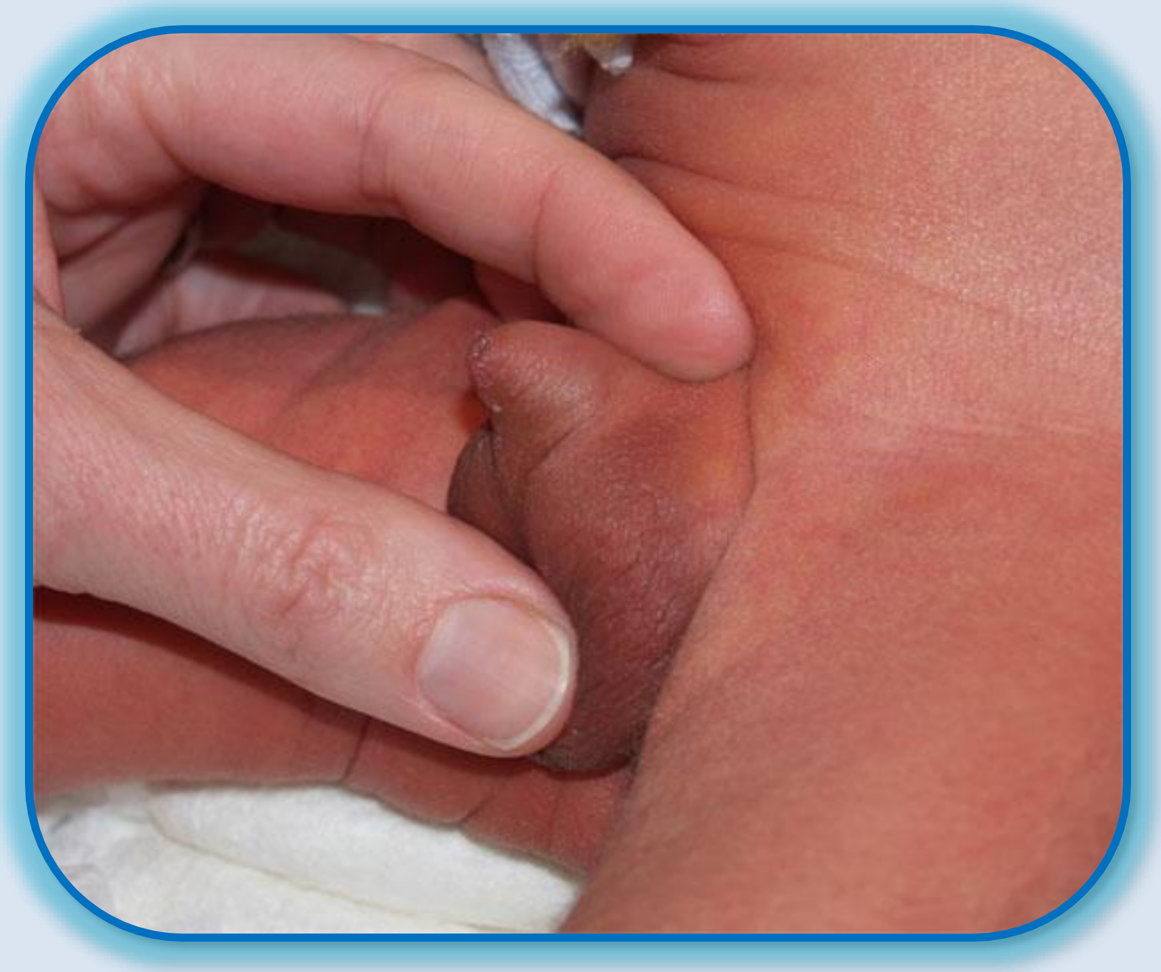
This is a frontal view of the same infant. The tip of the foreskin is not easily appreciated in the photograph, but on examination the foreskin and meatus appeared to be normal. Curvature of the shaft is the only abnormality in this case.

Webbed Penis



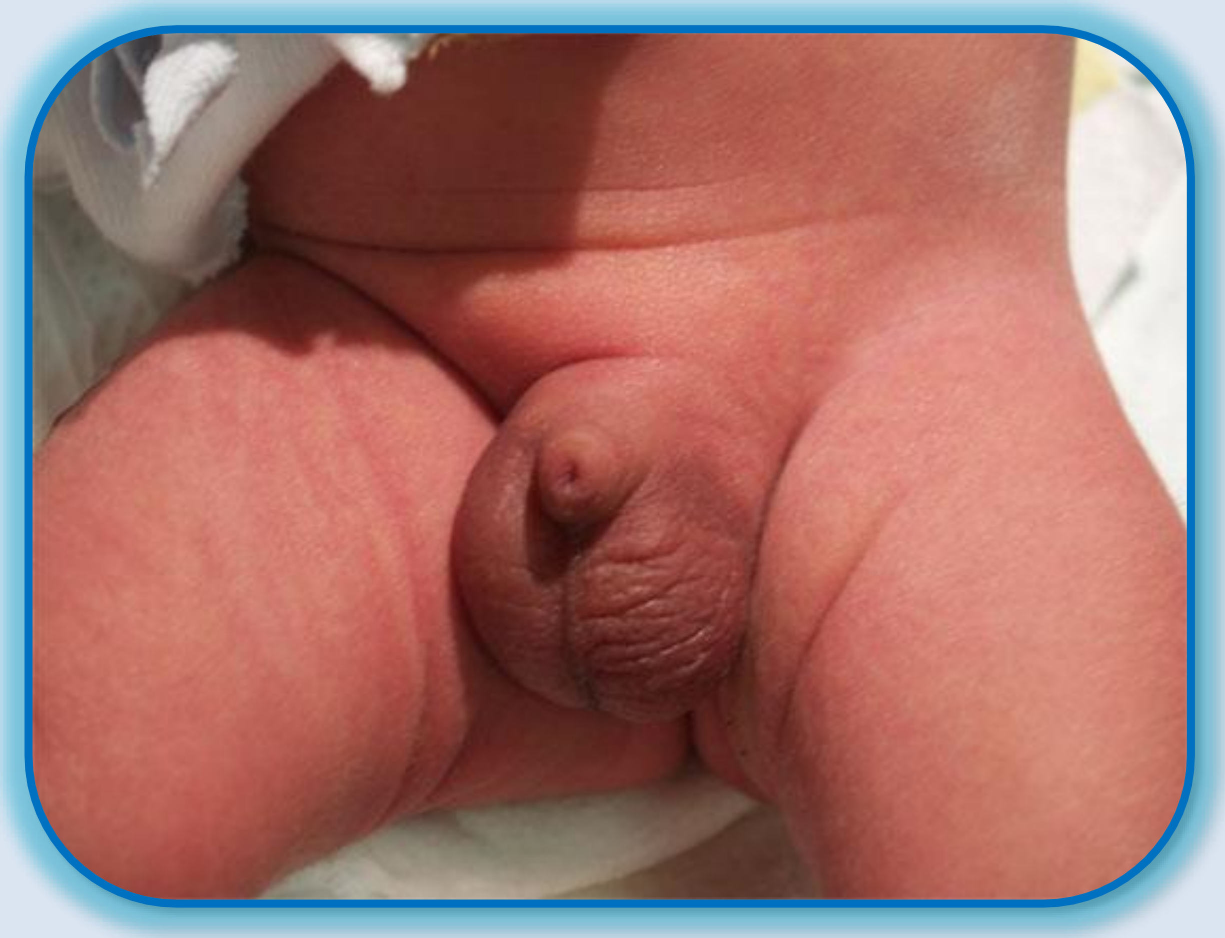
When present, a penoscrotal web (webbed penis) is **another contraindication to routine circumcision**. On cursory examination, the penis in this child appears to be within normal limits; however, there was very little skin surface between the tip of the foreskin and the scrotum. The following photo shows the abnormality more clearly.

Webbed Penis



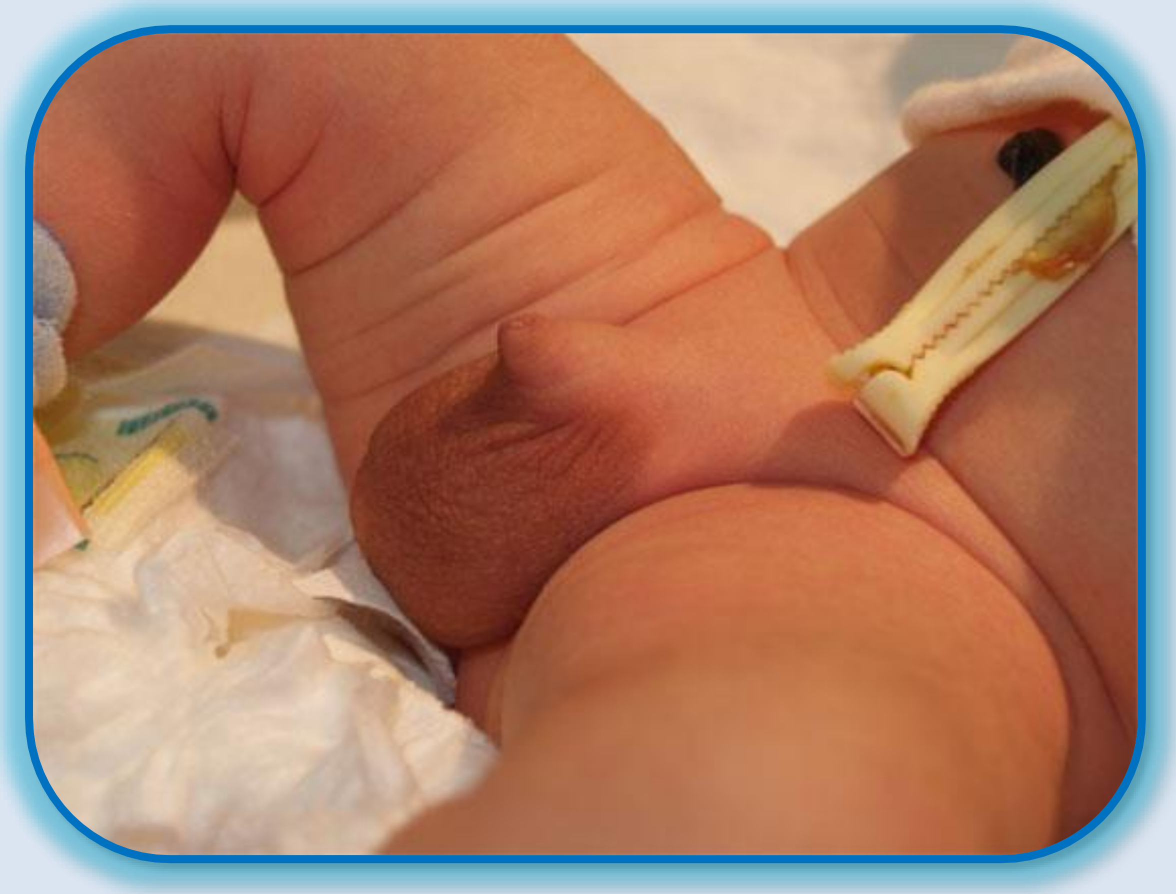
When traction is applied to the skin at the base of the penis, the web can more clearly be seen. **Routine circumcision is contraindicated** in this case as **it may lead to the penis becoming trapped behind a scarred, tent-like fold of skin**.

Buried Penis



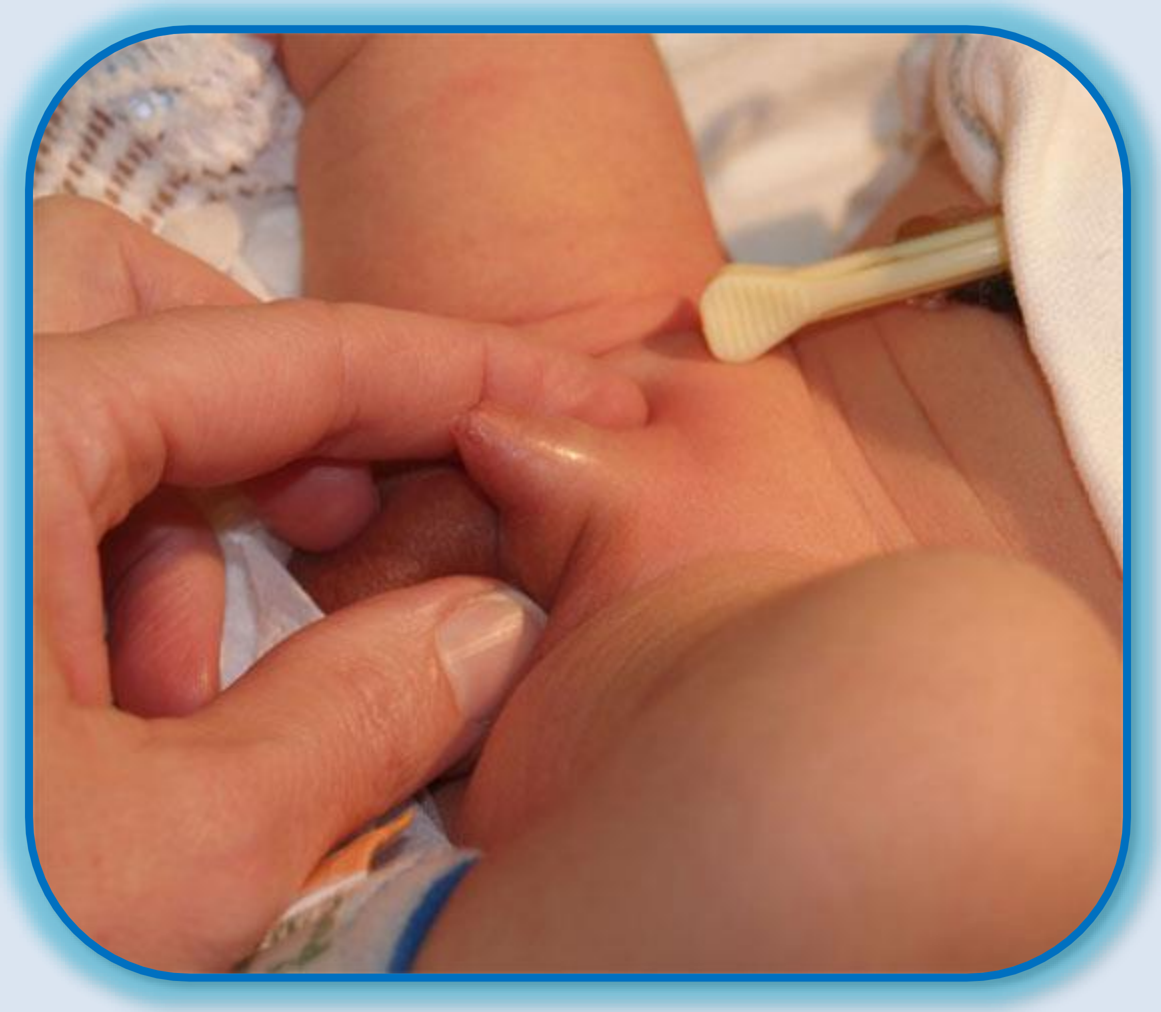
In some infants, the penis appears to be **"buried"** in the tissues surrounding it. This is another **contraindication to routine circumcision**, as it could result in the penis becoming **trapped** underneath the healing circumcision site and result in an overall worsening of the condition.

Buried Penis



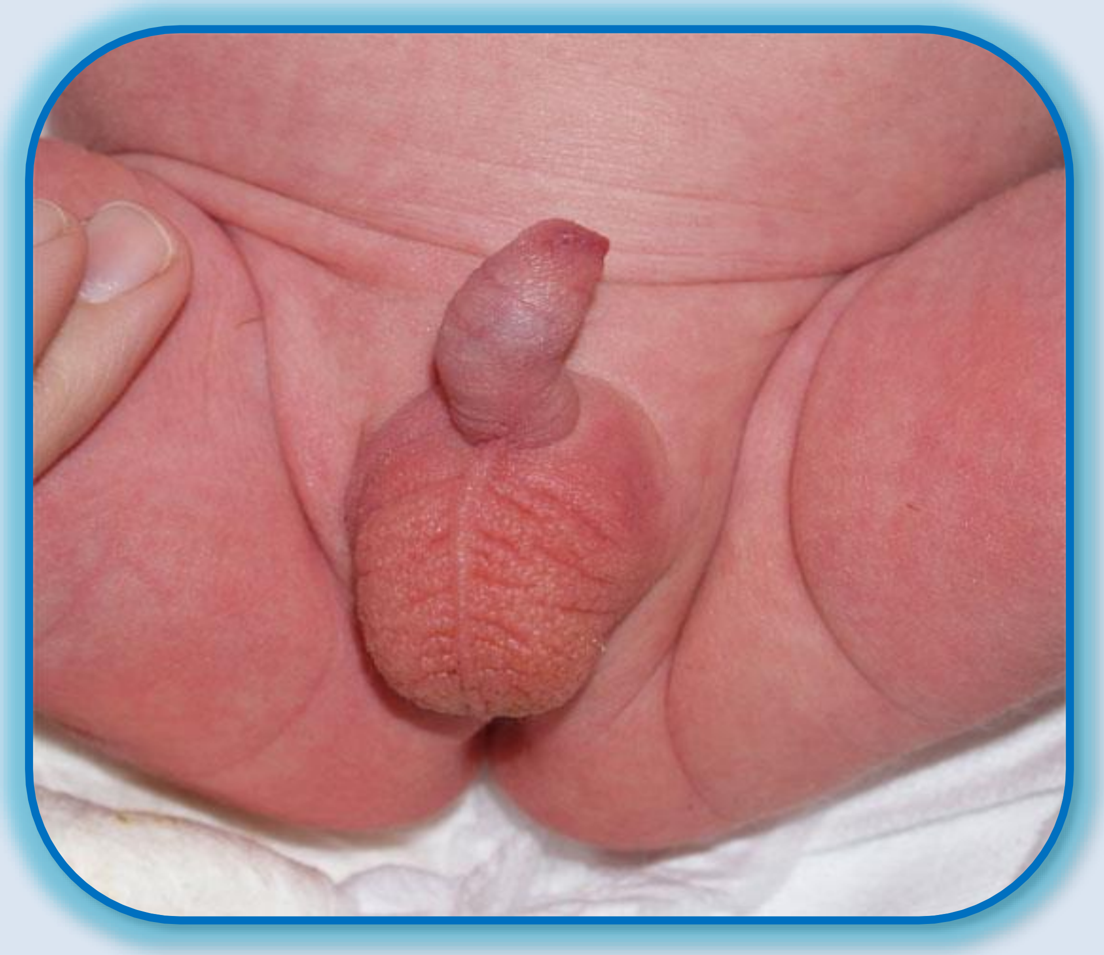
Here is another example of a newborn with a **buried (concealed) penis**. With this view, the **ventral foreskin looks unusually short and the shaft of the penis is not readily visible**.

Buried Penis



When downward pressure is applied beside the penile shaft, more of the underlying normal anatomy can be seen. However, because of the tendency of the penis to retract back into its previous position and because of the relatively small amount of foreskin present, this is still a **contraindication to routine neonatal circumcision**.

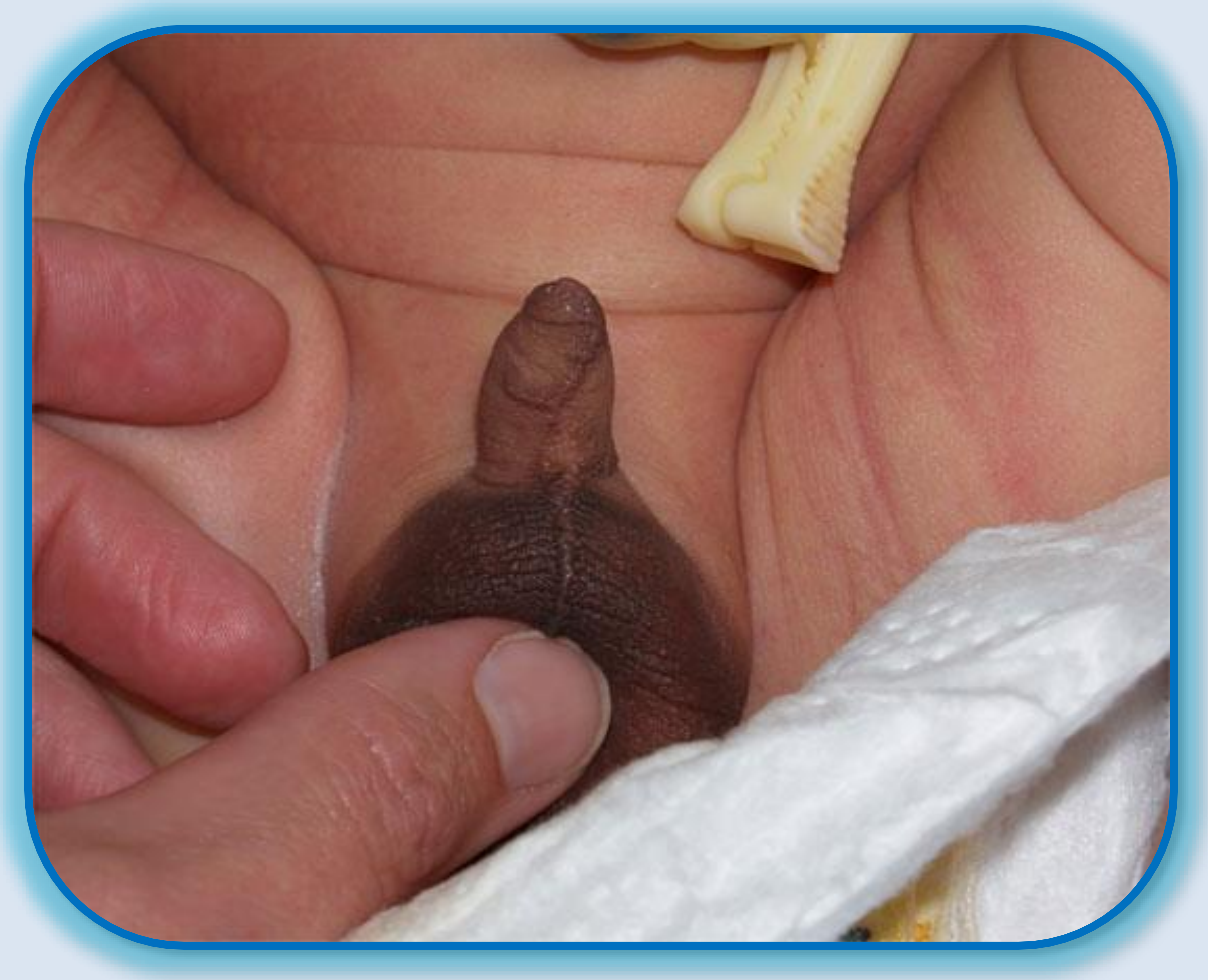
Penile Torsion



This is an example of penile torsion of about 90 degrees. A mild degree of torsion (<60 degrees) is felt to be a variation of normal and is not a contraindication for circumcision.

In this case, **circumcision was postponed until the time of surgical correction at about 4 months of age**. Penile torsion **does not cause functional impairment** in newborns, but **high degrees of torsion should be corrected** (with or without circumcision) **to prevent painful or dysfunctional erections in later life**.

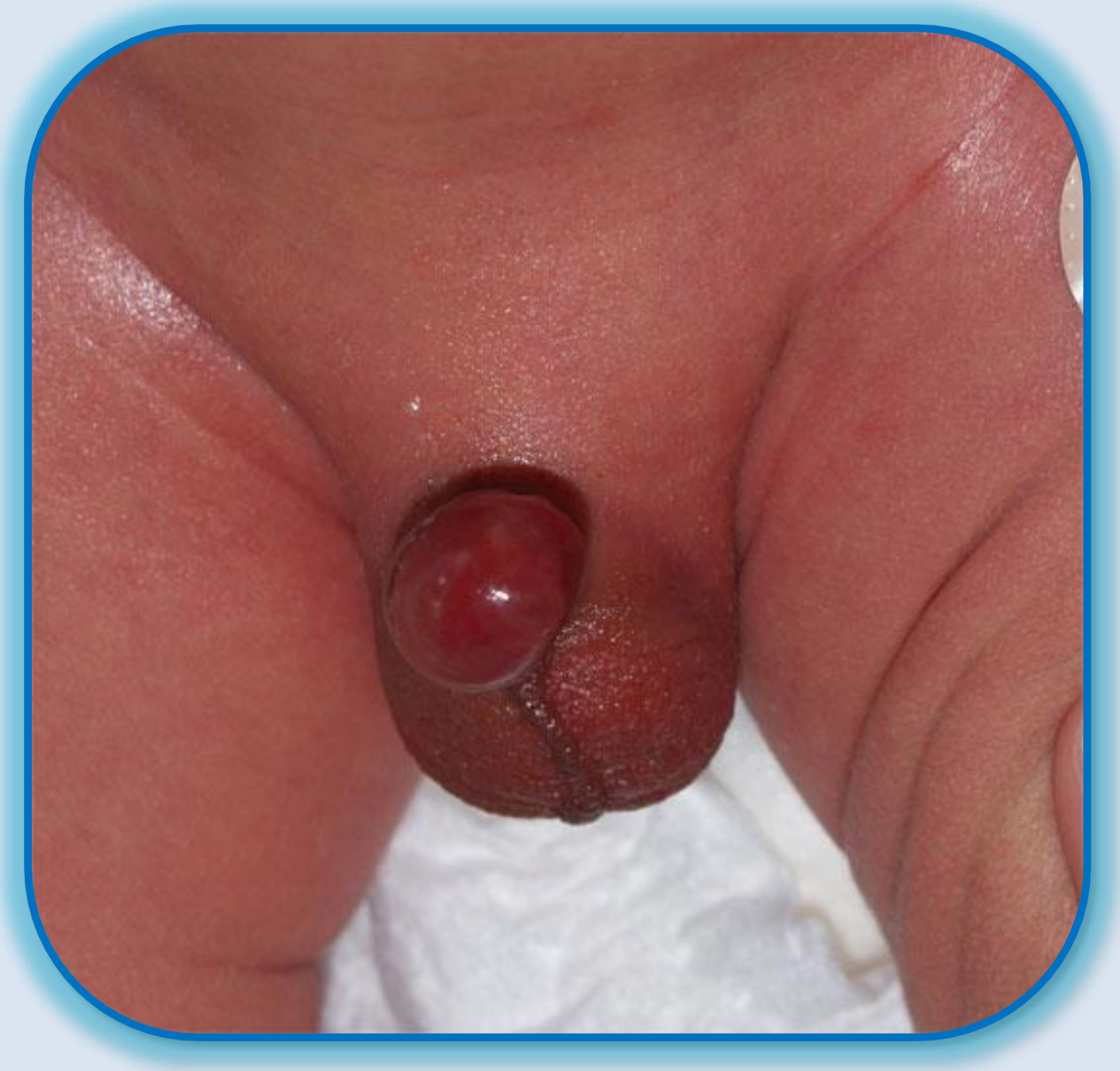
Penile Torsion



Another **clue** to a possible penile torsion is the **rotated appearance of the median raphe**.

Here, the raphe starts in the midline at the scrotum, but then **winds around the shaft** to the left and ends up on the left side at tip.

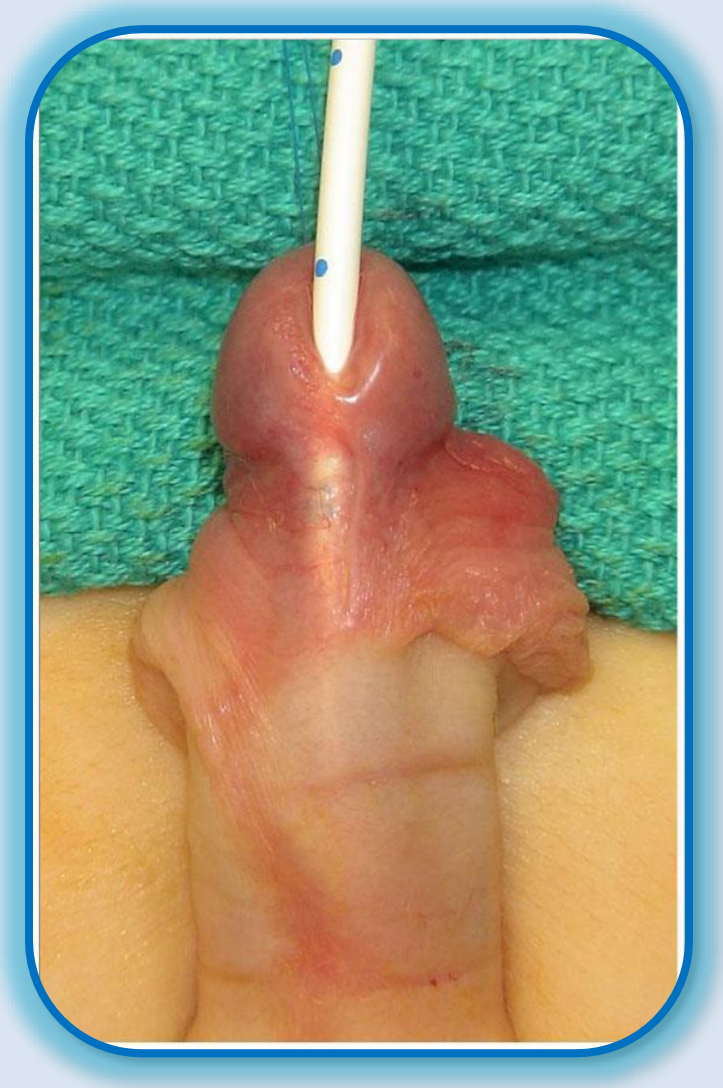
Penile Torsion



Because circumcision was desired and penile torsion was suspected, a urology consult was obtained before this procedure. All agreed that the likely torsion was about 45 degrees and that circumcision could safely be done.

Here the counterclockwise rotation of the urethral meatus can be seen in relation to the midline of the scrotum.

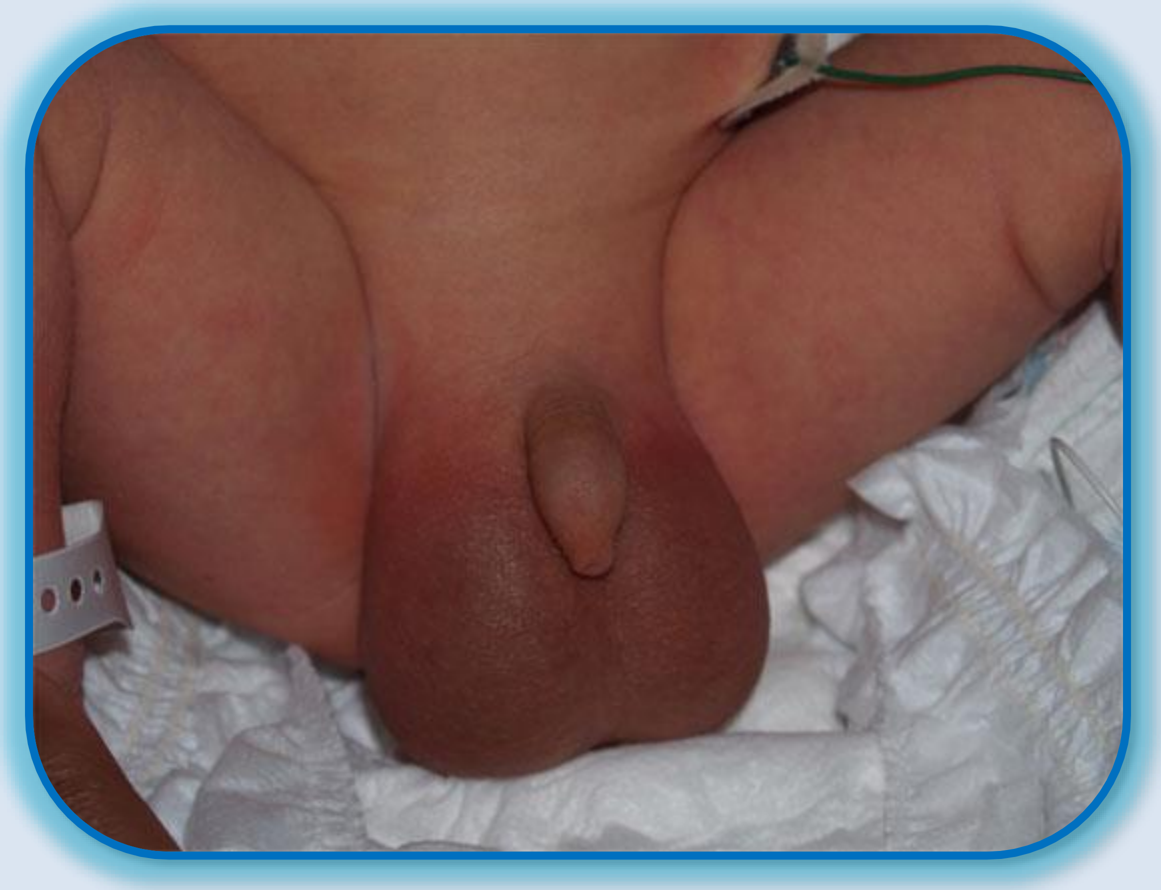
Hypoplastic Urethra



When examining the penis, assessment of the adequacy of skin circumferentially should be made. If the ventral side seems deficient, urethral hypoplasia may exist. Patients with this condition often have a penile raphe that zigzags back and forth as well as a **thinned or shortened foreskin on the ventral side**.

Circumcision is absolutely contraindicated, and a pediatric urologist should be consulted.

Hydrocele

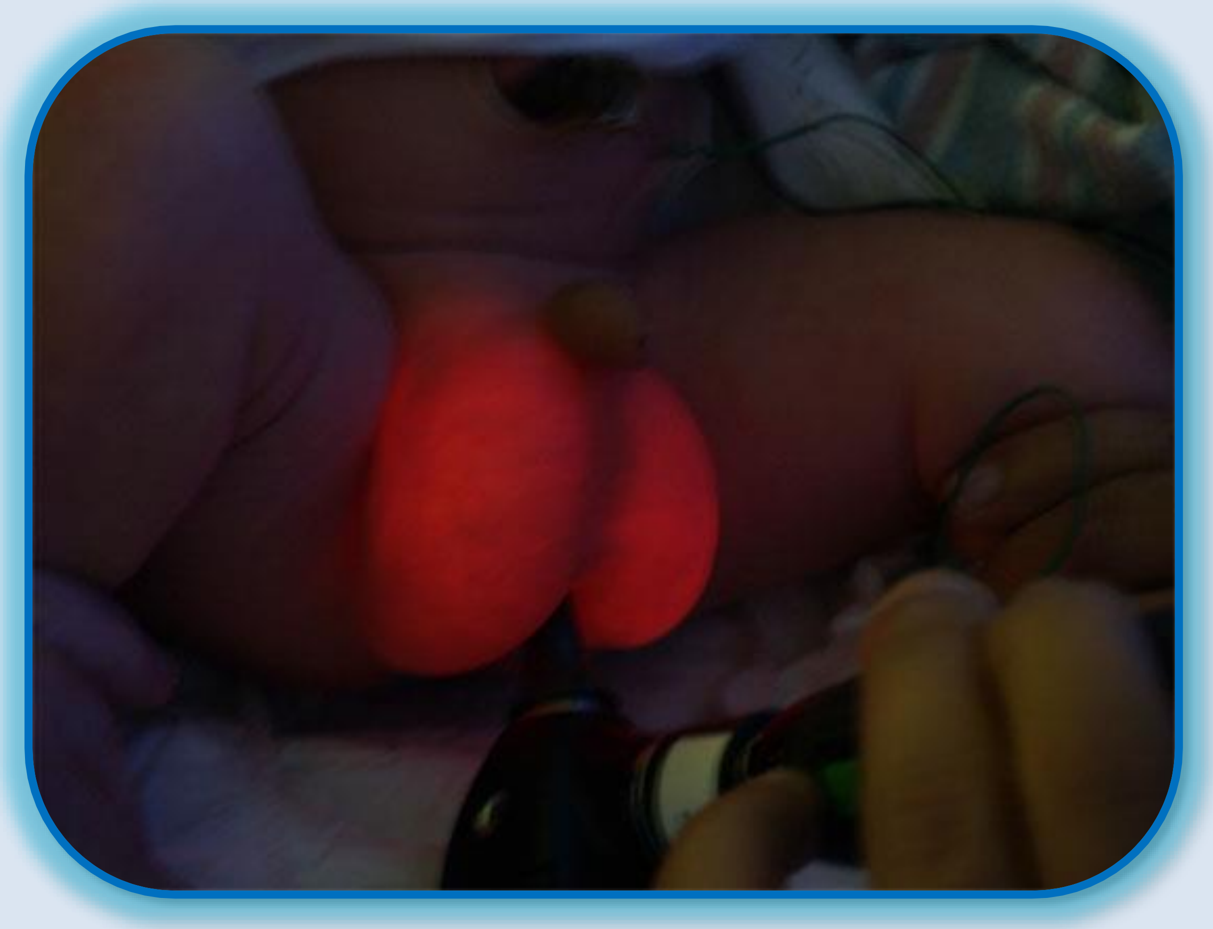


Hydroceles are a frequent finding in newborns.

It is important on **palpation** to identify the normally **small testicles** (approximately 1 cm) as separate entities from the large, smooth-walled fluid collections of hydroceles.

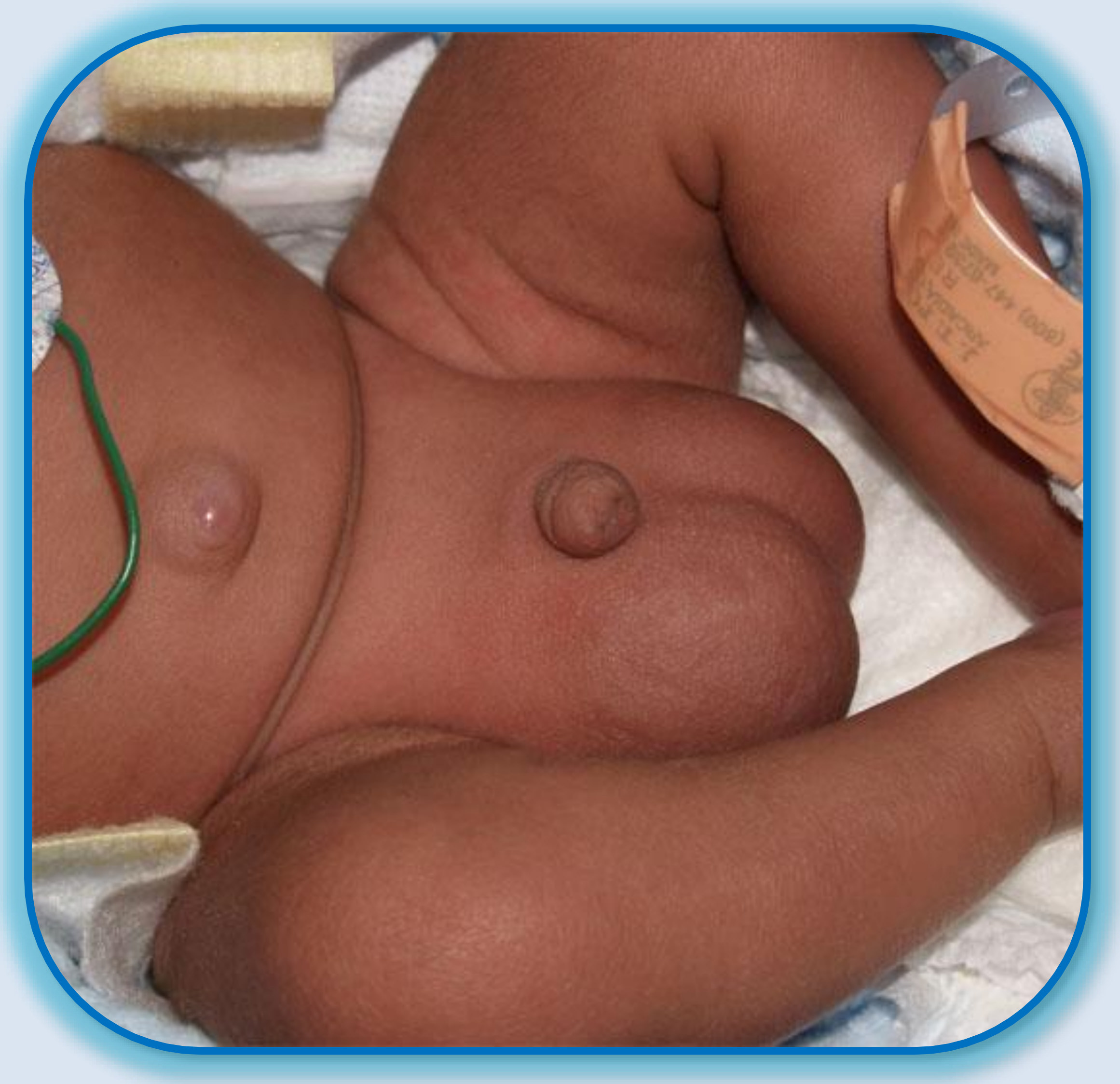
In contrast to inguinal hernias, common (non-communicating) hydroceles cannot be reduced as the fluid is in an enclosed space. Spontaneous resolution is expected.

Hydrocele



Here one can see how easily the fluid-filled hydroceles transilluminate. **Transillumination** may be used to assist in making a diagnosis but for an experienced examiner, the diagnosis is usually made by palpation alone.

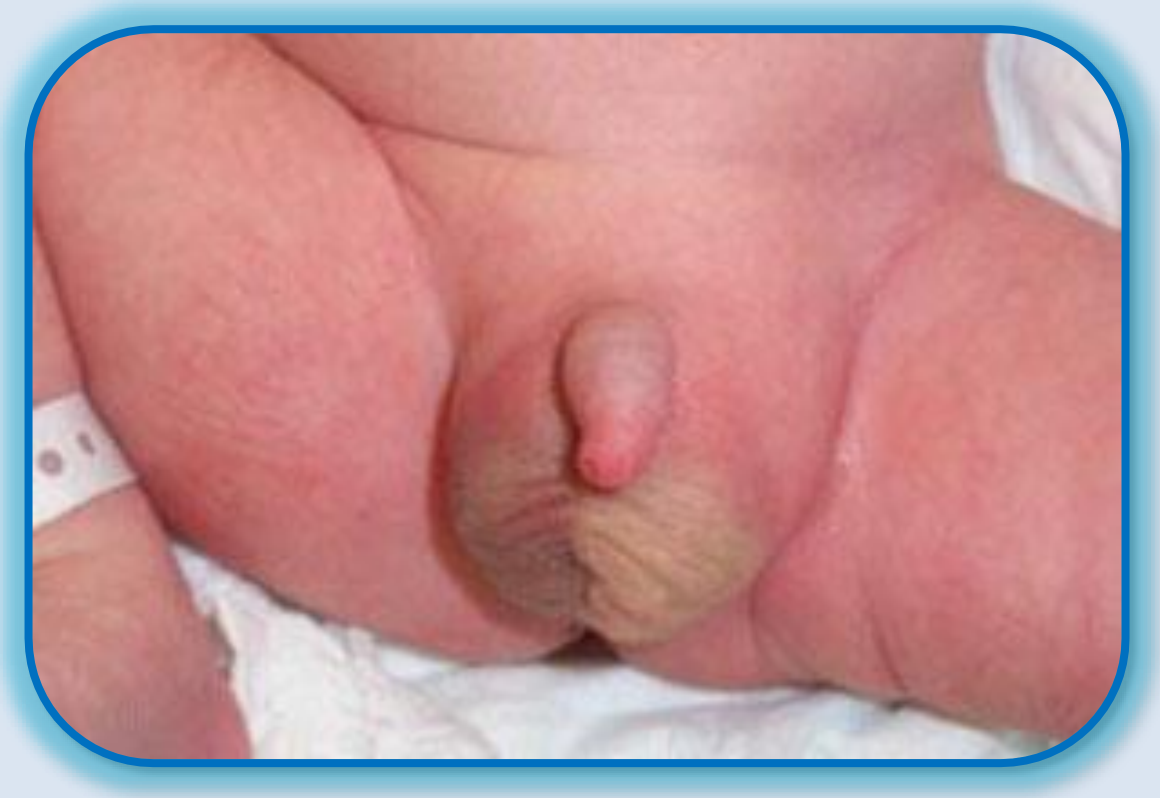
Inguinal Hernia



This is a typical appearance of **bilateral** inguinal hernias.

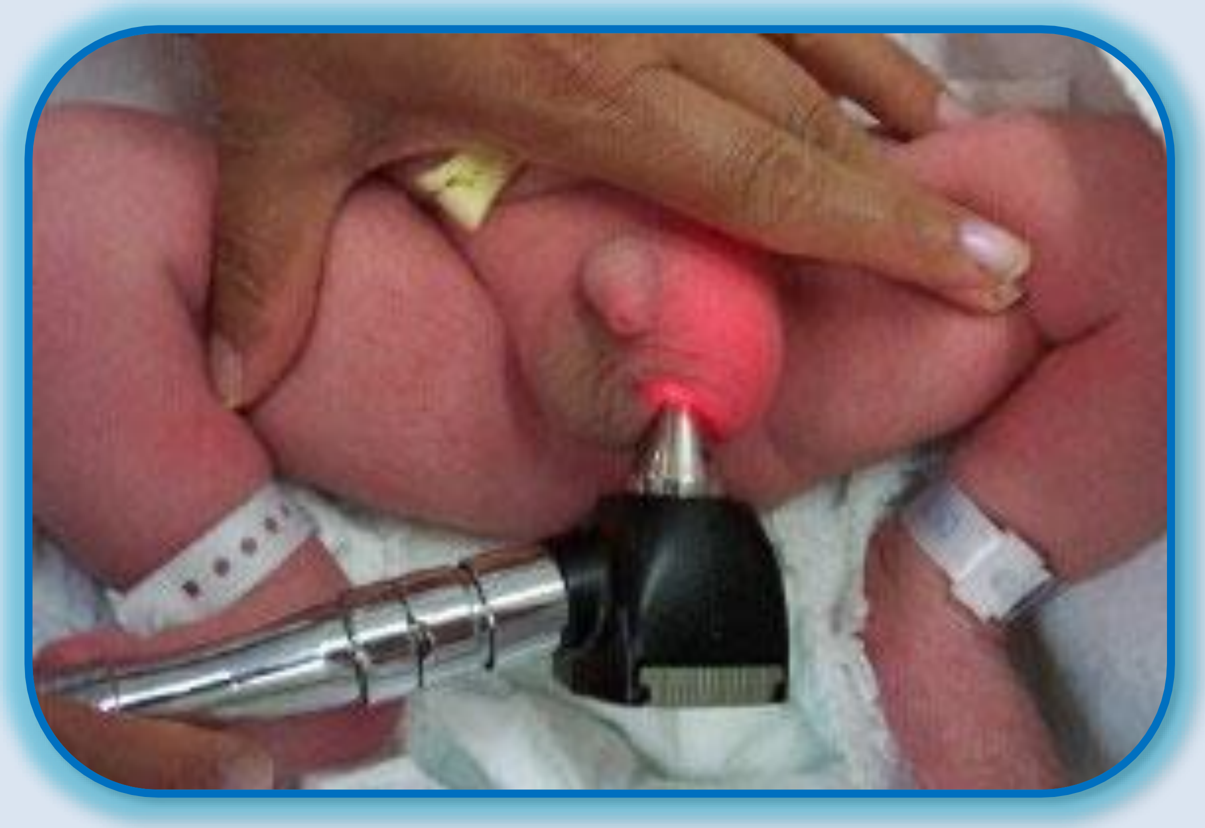
In contrast to hydrocele, inguinal hernias are typically associated with a **fullness in the inguinal area**. This infant is **preterm**, a risk factor for the presence of hernias. While the scrotum may transilluminate with hernias, the masses can frequently be reduced with digital pressure. At times **bowel sounds** may also be appreciated over the area of the mass.

Acute Testicular Torsion



This otherwise well infant presented with **acute color change of the scrotum**. The right testicle was torsed and the baby was taken emergently to surgery.

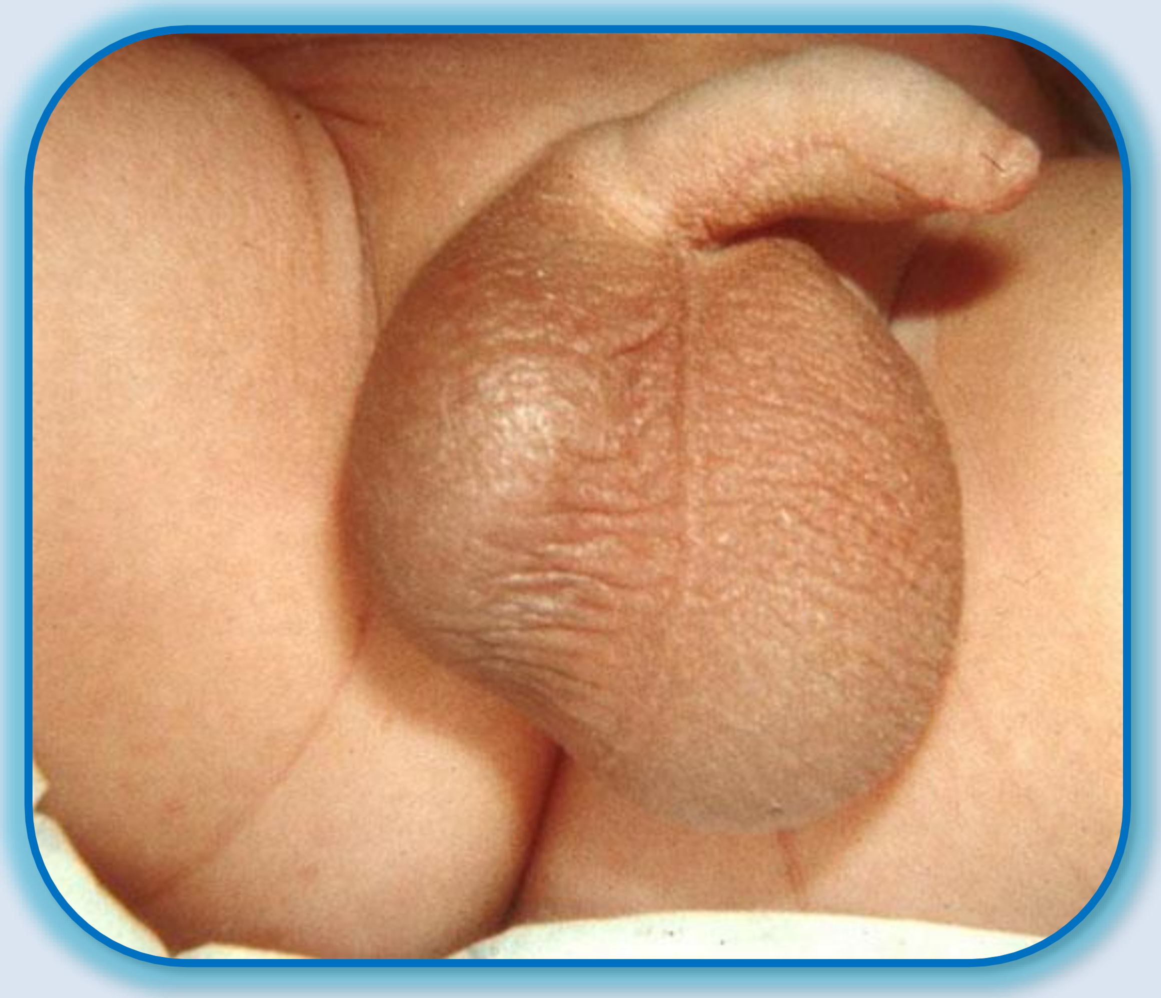
Acute Testicular Torsion



The same infant as in the previous photo.

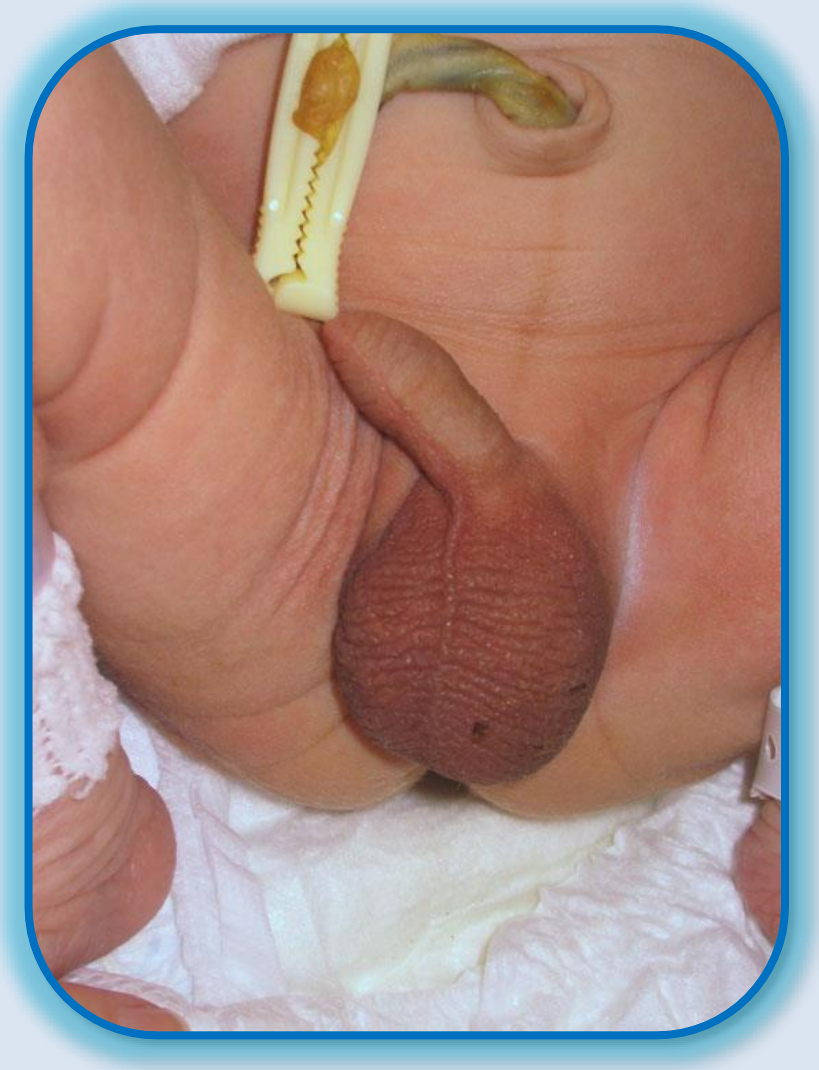
Because of the pathology in the right testicle, the right scrotum does not transilluminate equally with the left.

Testicular Torsion



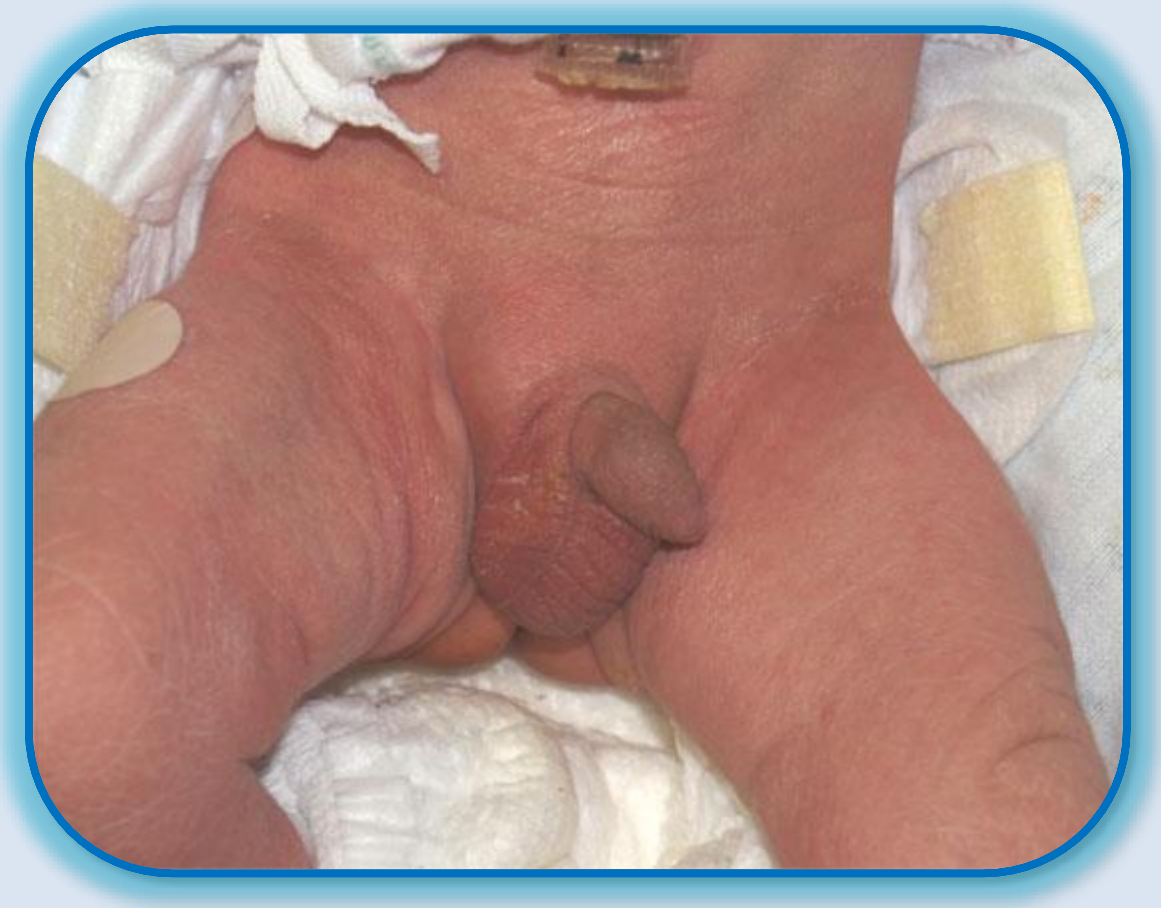
This is another example of testicular torsion in the newborn. Here, the discoloration is more subtle, but the difference in size between the two halves of the scrotum is striking. The testicle on the baby's right side is the affected one.

In Utero Testicular Torsion



With antenatal torsion, the scrotum typically has a normal appearance. On examination, however, the right testicle was slightly larger and more mass-like in texture than the normal left testicle. Ultrasound with **Doppler** confirmed that there was no **blood flow** to the right side. This infant was taken to the OR on day 2 for **removal** of the right testicle and **fixation** of the left testicle as the contralateral side is also at **increased risk of torsion**.

Descending Testicle

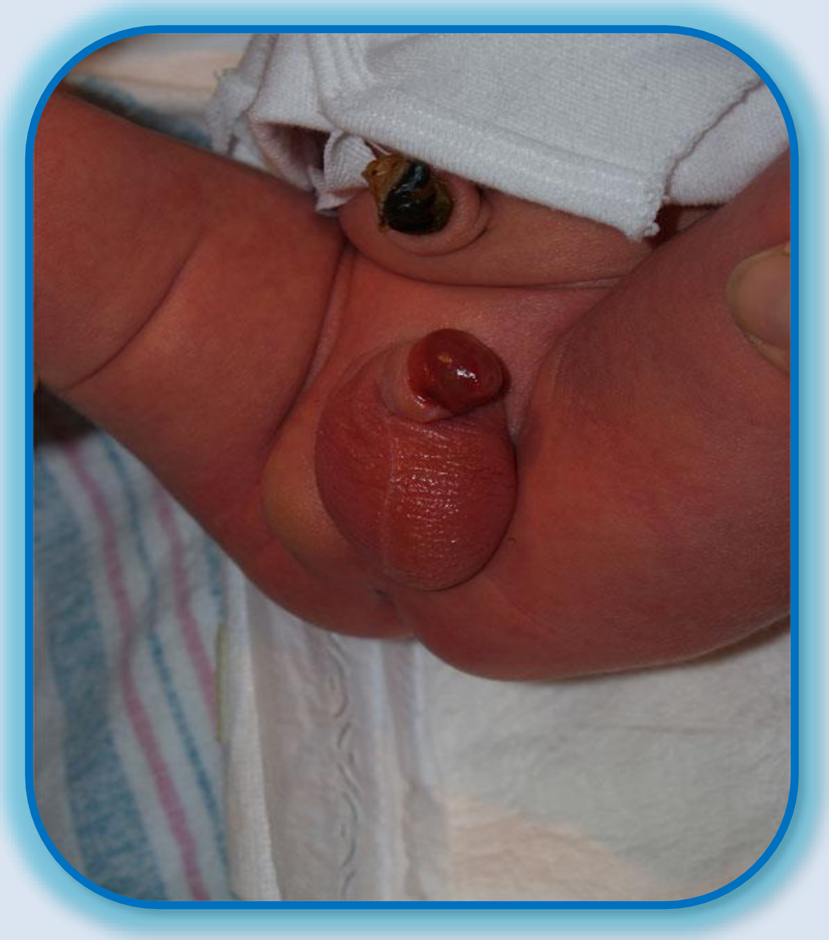


In a term infant, the testicles have normally completed their **migration** from the abdomen into the scrotum. However, even term infants will at times have one testicle that is undescended or incompletely descended.

In this infant, the right side of the scrotum was **empty** and the **testicle was palpated in the inguinal canal** (seen as a bulge).

Because this testicle is located along the **normal pathway** of descent and is **not ectopic**, no further evaluation is needed. **Spontaneous descent** into the scrotum is expected with time.

Ectopic Testicle

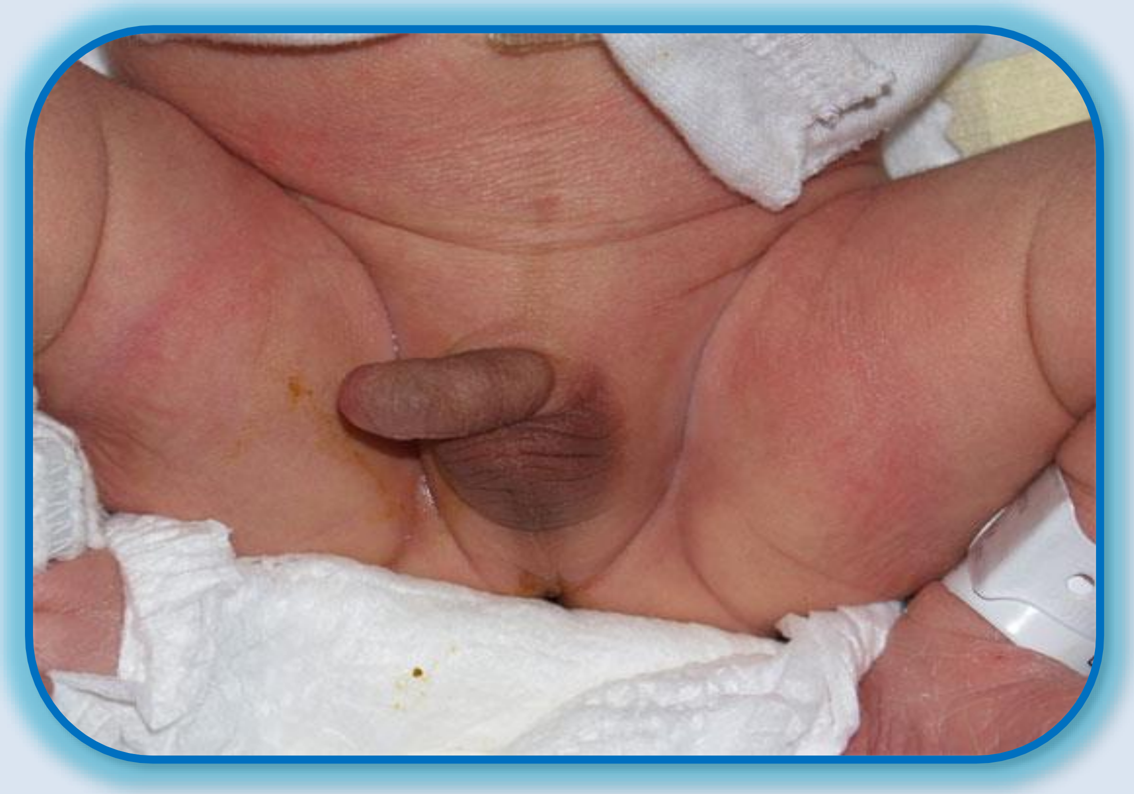


During descent, it is possible for the testicle to pass through the inguinal ring and then veer off course into an aberrant location.

On examination of this infant, the **right testicle was absent** from the scrotum, but a mass was appreciated over the perineum. **Ultrasound confirmed the diagnosis** of ectopic testicle.

Ectopic testicles may be found in the superficial inguinal pouch, the suprapubic area, the perineum, the femoral canal, or even the other side of the scrotum.

Undescended Testicles



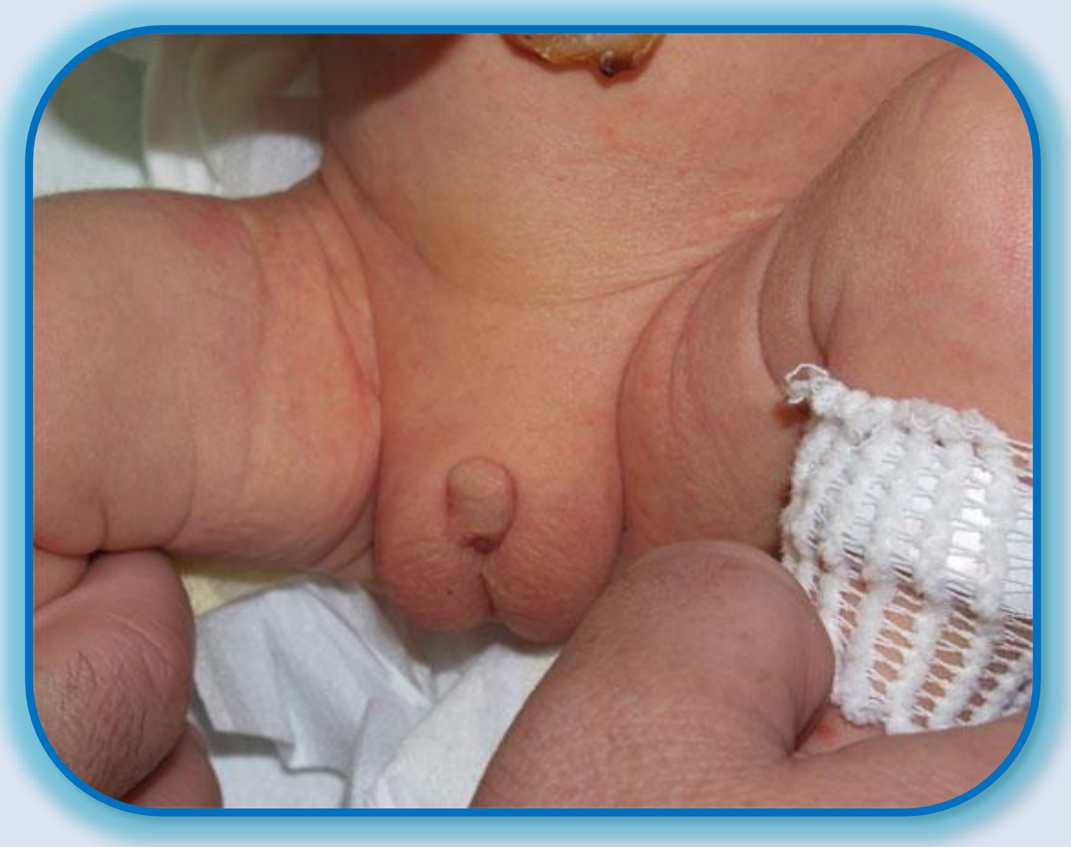
At times, the testicles are not palpable at all in the scrotum. In the photo above, the scrotum appears mature, but quite flat.

Unilateral undescended testicle is fairly **frequently** encountered in term newborns and **does not** require further evaluation at birth.

Bilateral undescended testicles, however, are quite unusual at term and should be considered as ambiguous genitalia until proven otherwise.

As a first step, **ultrasound** can be used to assess the presence or absence of Mullerian structures internally or may identify testicles in the inguinal canal that were not appreciated on exam. In this infant, testicles were identified in the lower abdomen.

Ambiguous Genitalia



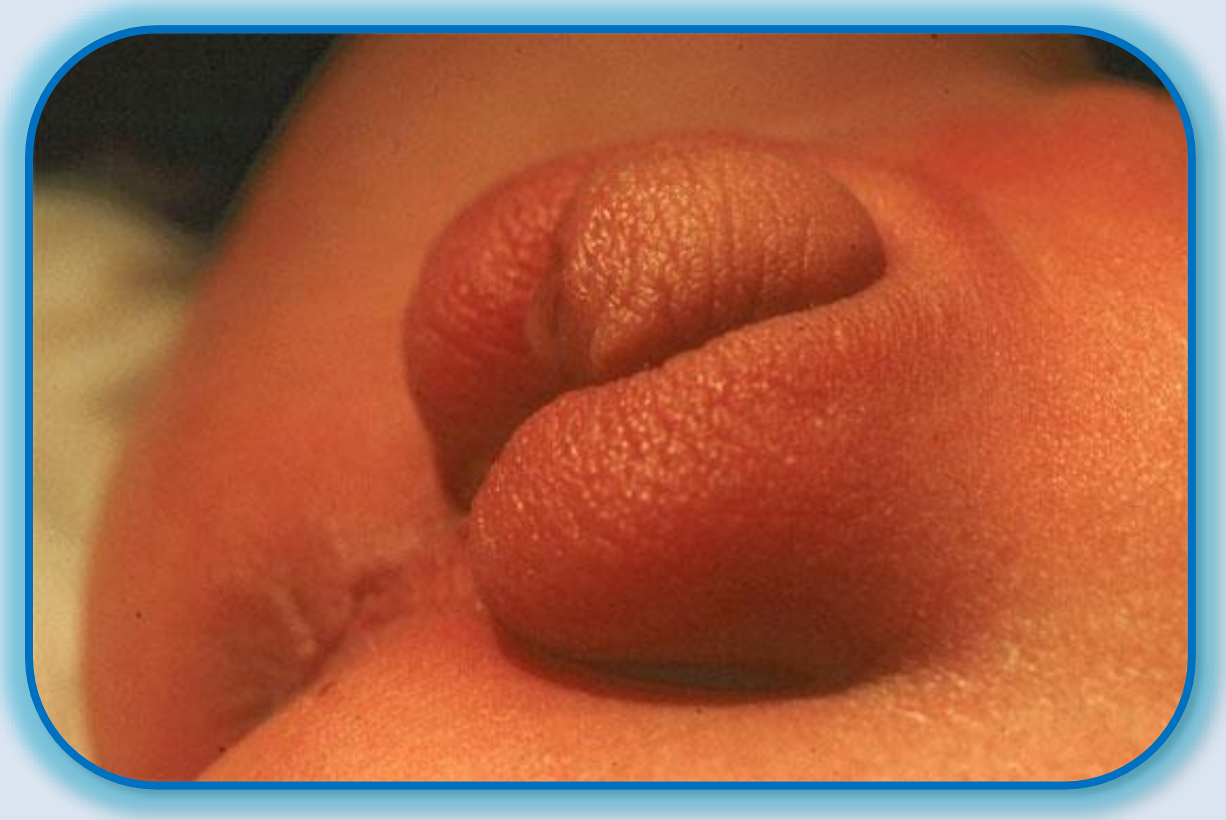
In any case where the genitalia are ambiguous, a work-up to determine gender and the underlying cause of the ambiguity should begin immediately.

These infants should be initially observed in the NICU so that any electrolyte abnormalities can be identified and treated rapidly, and appropriate specialists involved (e.g. endocrine, genetics, urology).

Circumcision is absolutely contraindicated when genital ambiguity exists.

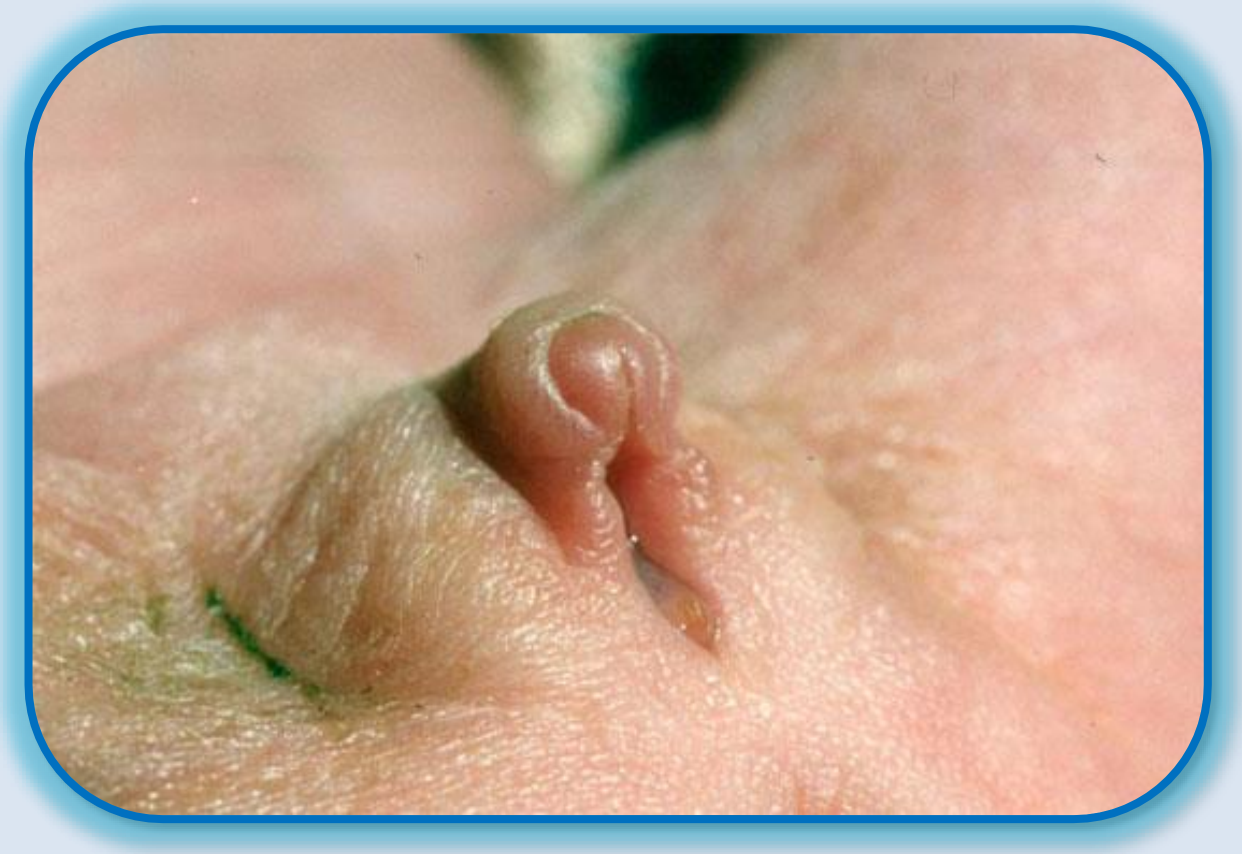
This particular infant was an **under-virilized** male with hypospadias, micropenis, and bifid scrotum (testes were present bilaterally).

Ambiguous Genitalia



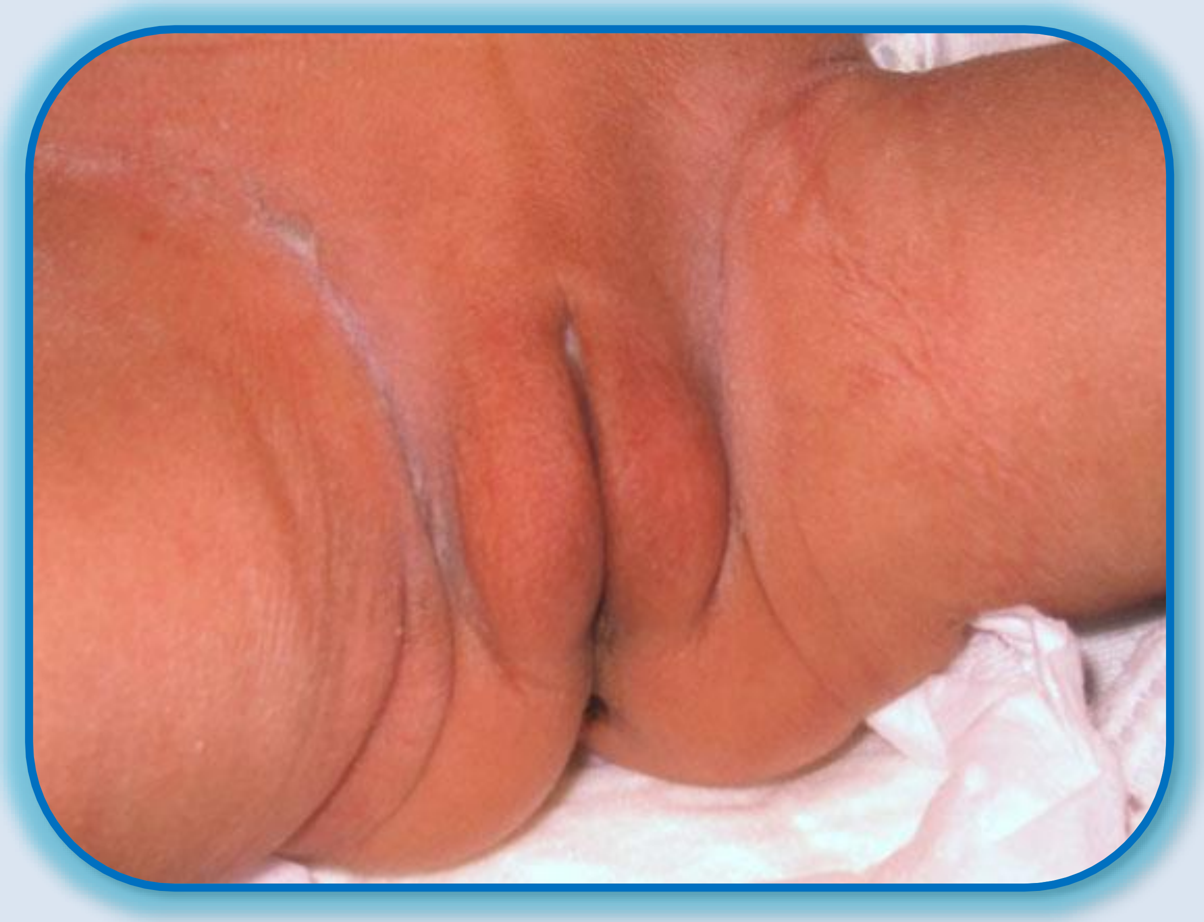
This baby has genitalia that appear similar to the previous photo, but this infant was a **virilized female with 21 hydroxylase deficiency.**

Ambiguous Genitalia



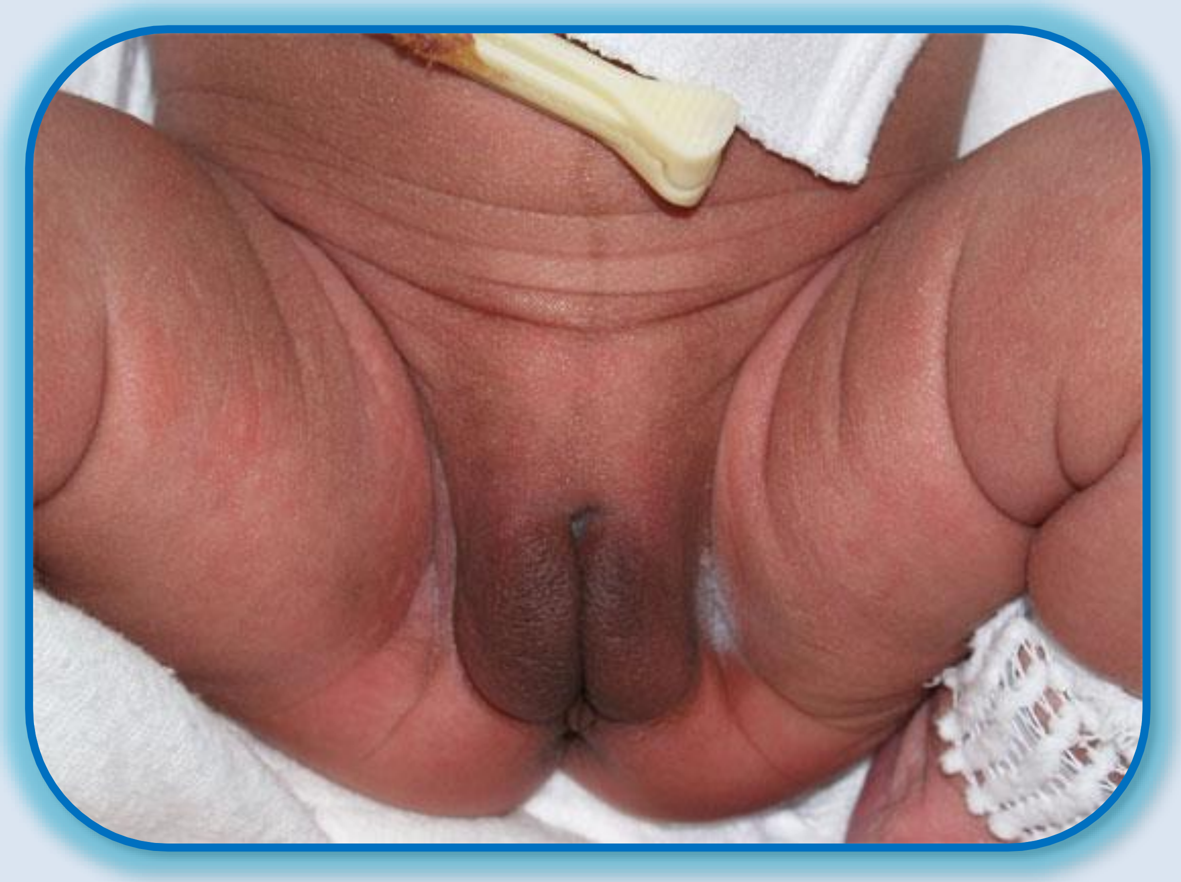
This infant is a male with **micropenis and a cleft scrotum**, but on initial evaluation the gender cannot readily be determined. Genetic, metabolic, and urologic evaluation is necessary.

Normal Female Genitalia



Normal female genitalia in a term infant. Some vernix is visible in the right inguinal crease.

Normal Female Genitalia

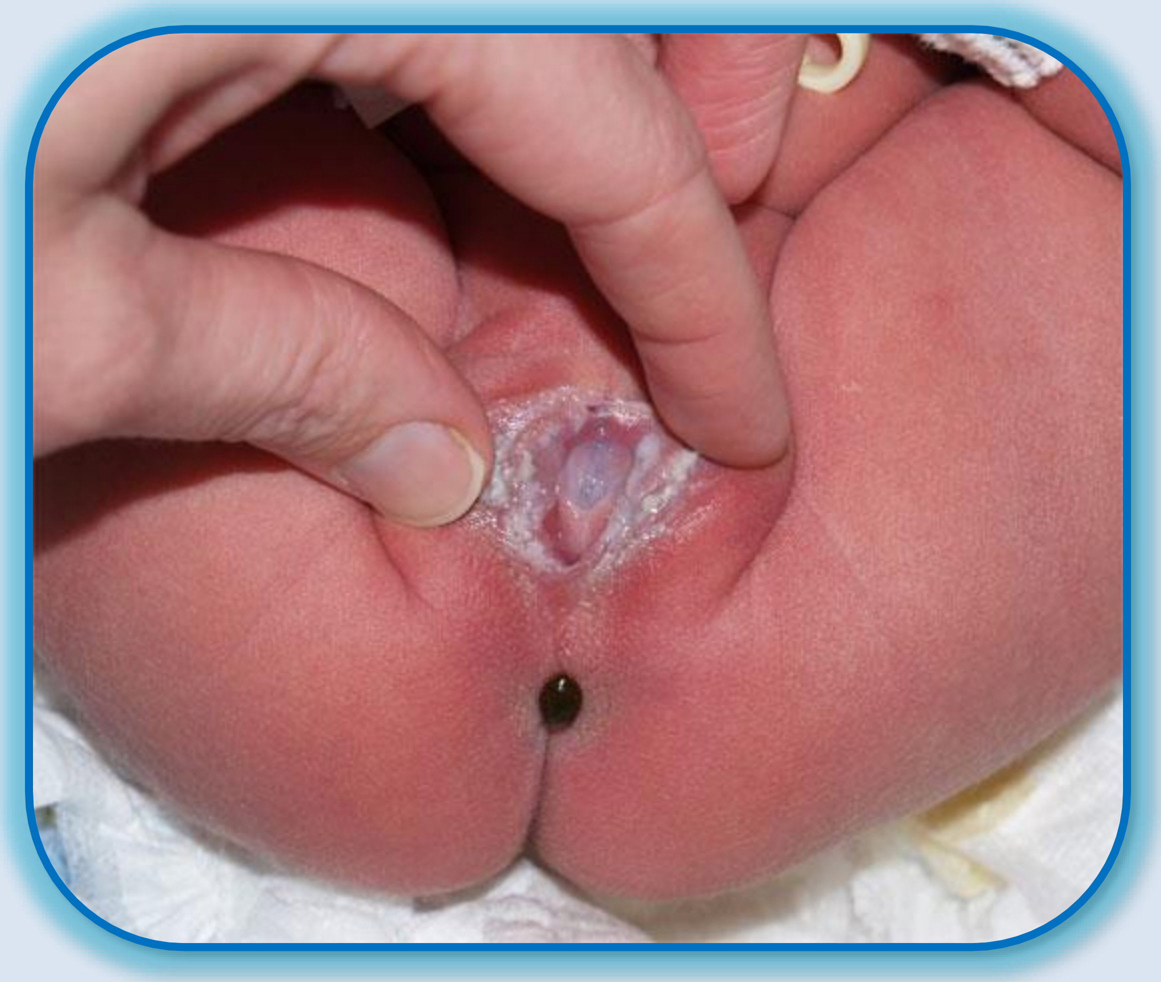


The increased pigment over the labia in this African-American newborn is normal.

Both the color of the parents and exposure to maternal hormones in utero impact the appearance, so a wide variation in pigment tones is expected. Those babies with more melanin tend to have increased pigment in several places: helices of the ears, bases of the nails, in the axillae, at the edge of the umbilical stump, and over the scrotum or labia.

Maternal hormone exposure produces the **linea nigra** (down the middle of the abdomen) that can also be seen in this picture.

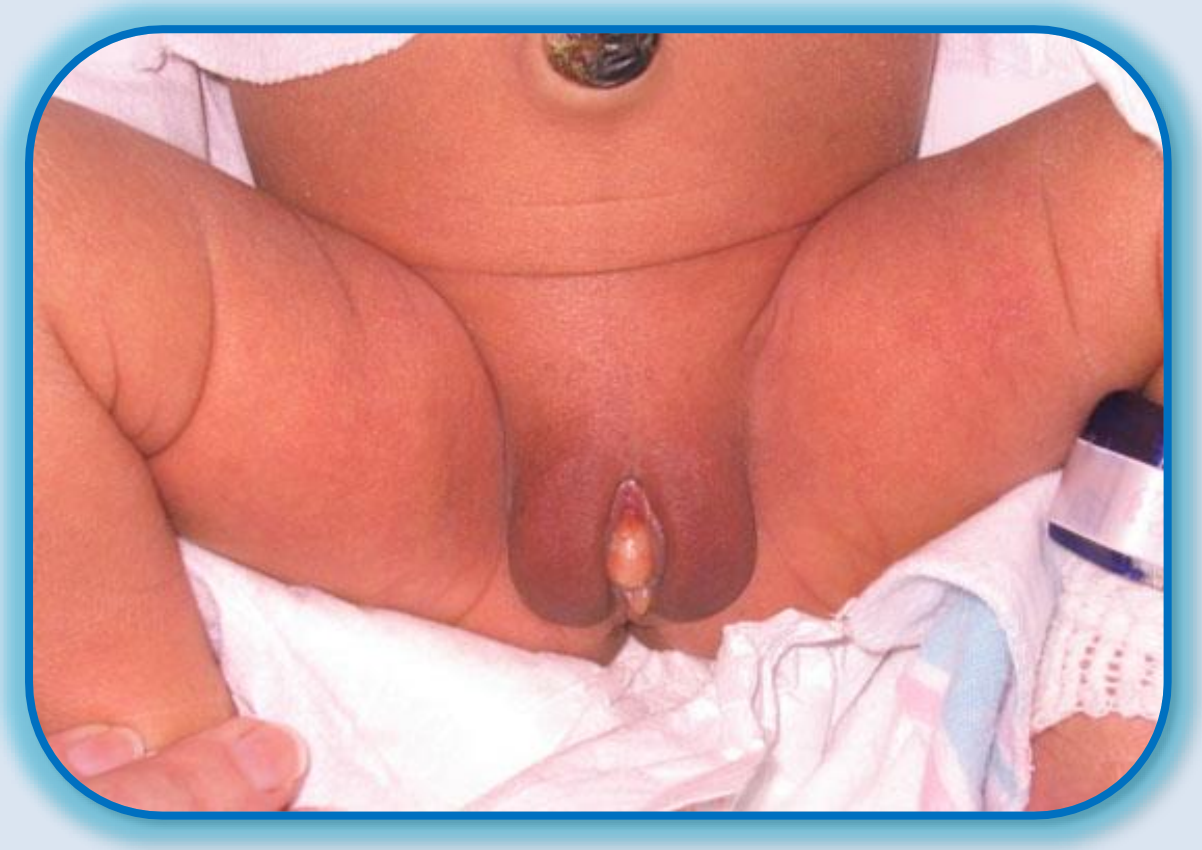
Normal Female Genitalia



When examining the genitalia of a girl, it is important to visualize the hymenal tissue and labia minora. It should appear to have a central opening, as it does here.

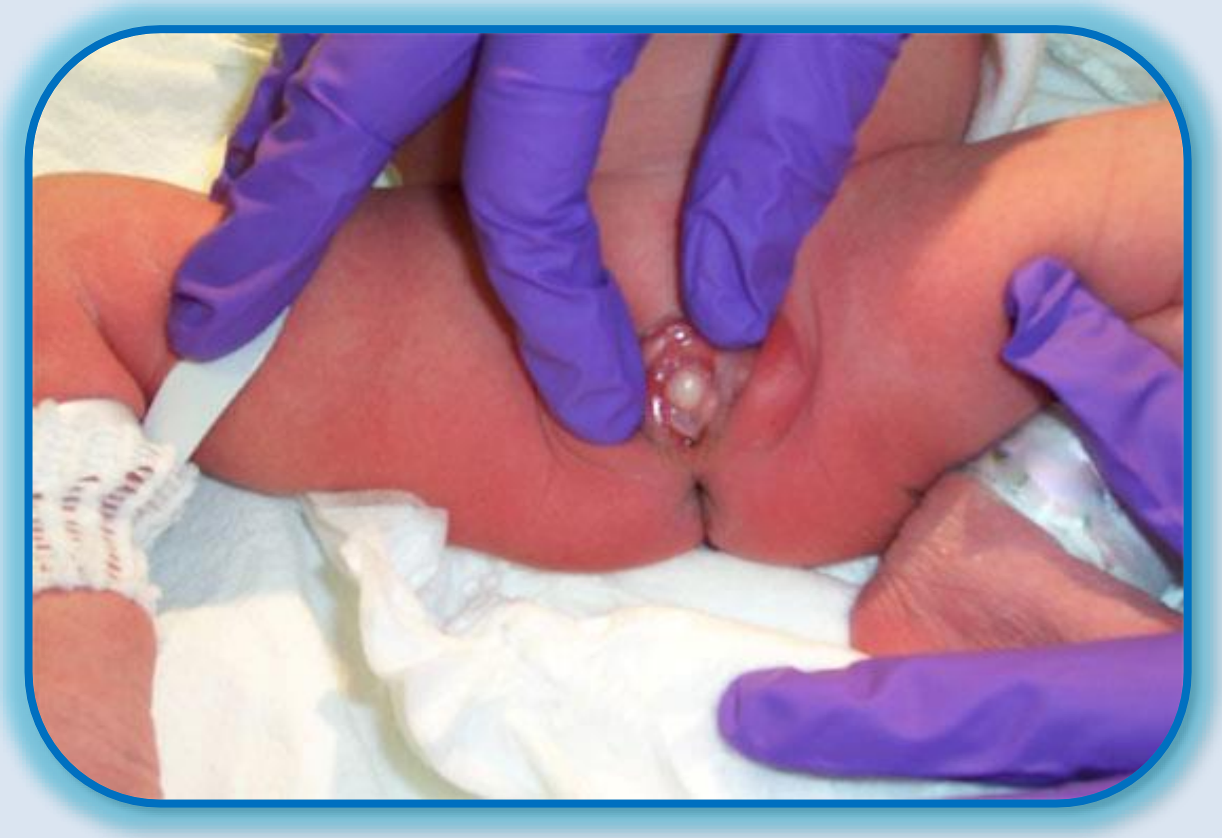
White vaginal discharge is extremely common in the newborn period. This infant also has some vernix on the interior surface of the labia majora. No special cleaning is required.

Vaginal Mass



This mass was noted on the discharge examination. It was not readily visible on casual examination of the external genital, but with increased abdominal pressure from crying or with closer inspection of the genitalia, it could be seen. Voiding was not impaired. The imaging studies in this case revealed a multiloculated cyst. The small, light pink tissue inferior to the mass is a hymenal tag, a normal finding.

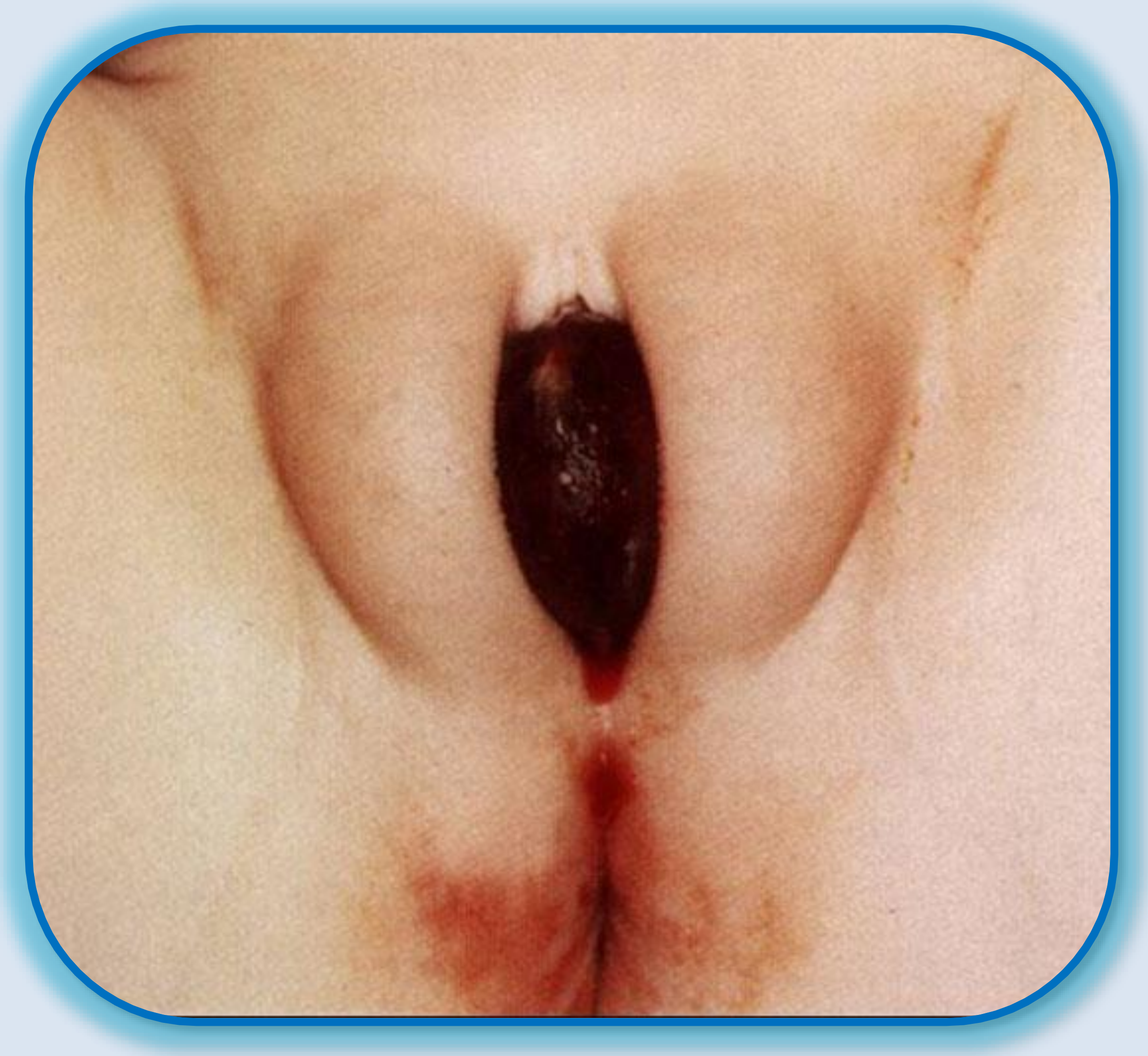
Paraurethral Cyst



This mass, present at birth, was a paraurethral cyst.

The fact that the **hymen can still be seen inferior** to the mass helps differentiate this from imperforate hymen, which could have a similar appearance.

Prolapsed Ureterocele



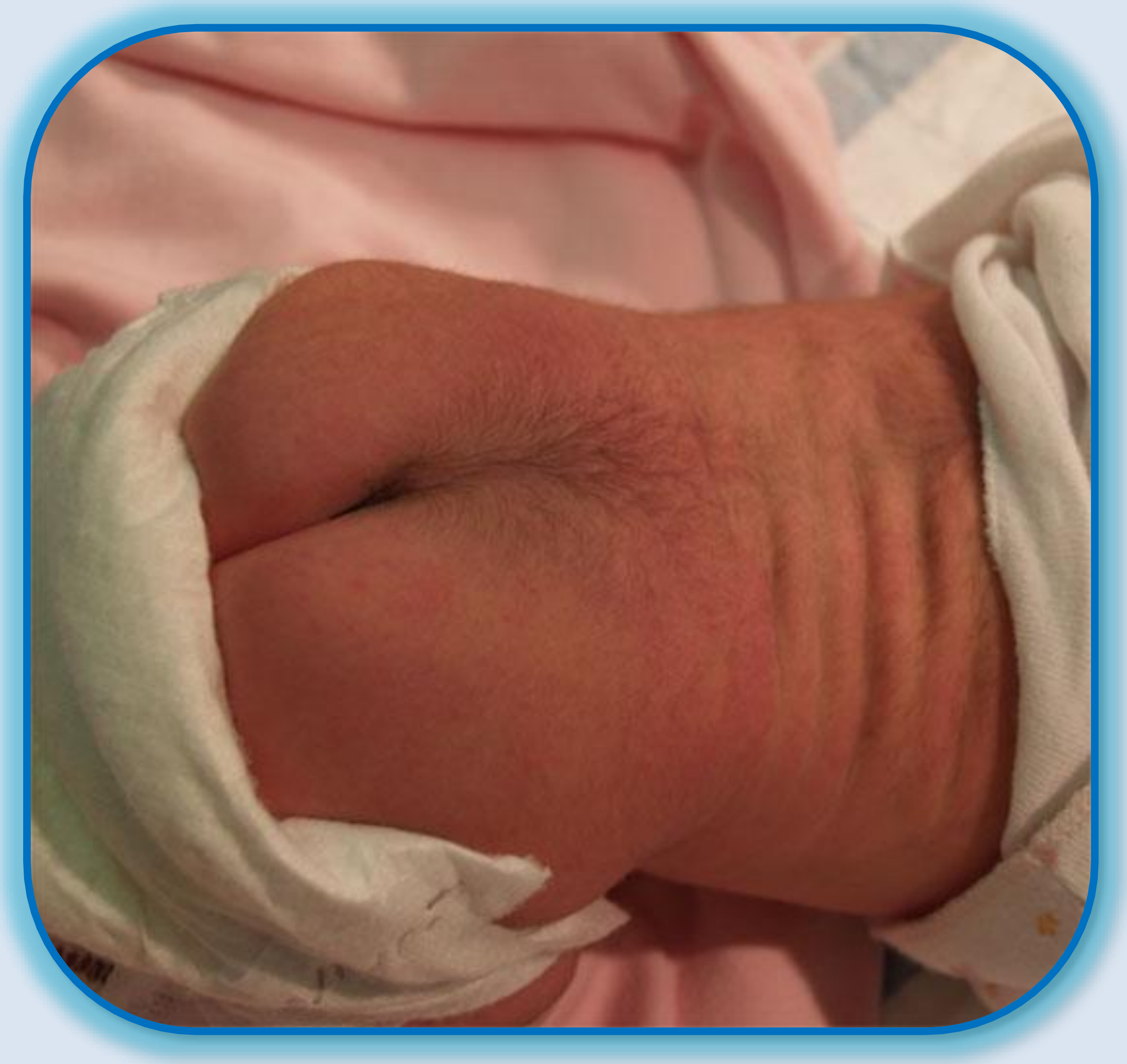
This mass is large enough to obscure all intra-labial landmarks, and is quite hemorrhagic in appearance.

This is a ureterocele which has actually prolapsed through the urethra to be visible externally.

Surgical intervention is necessary in this case.

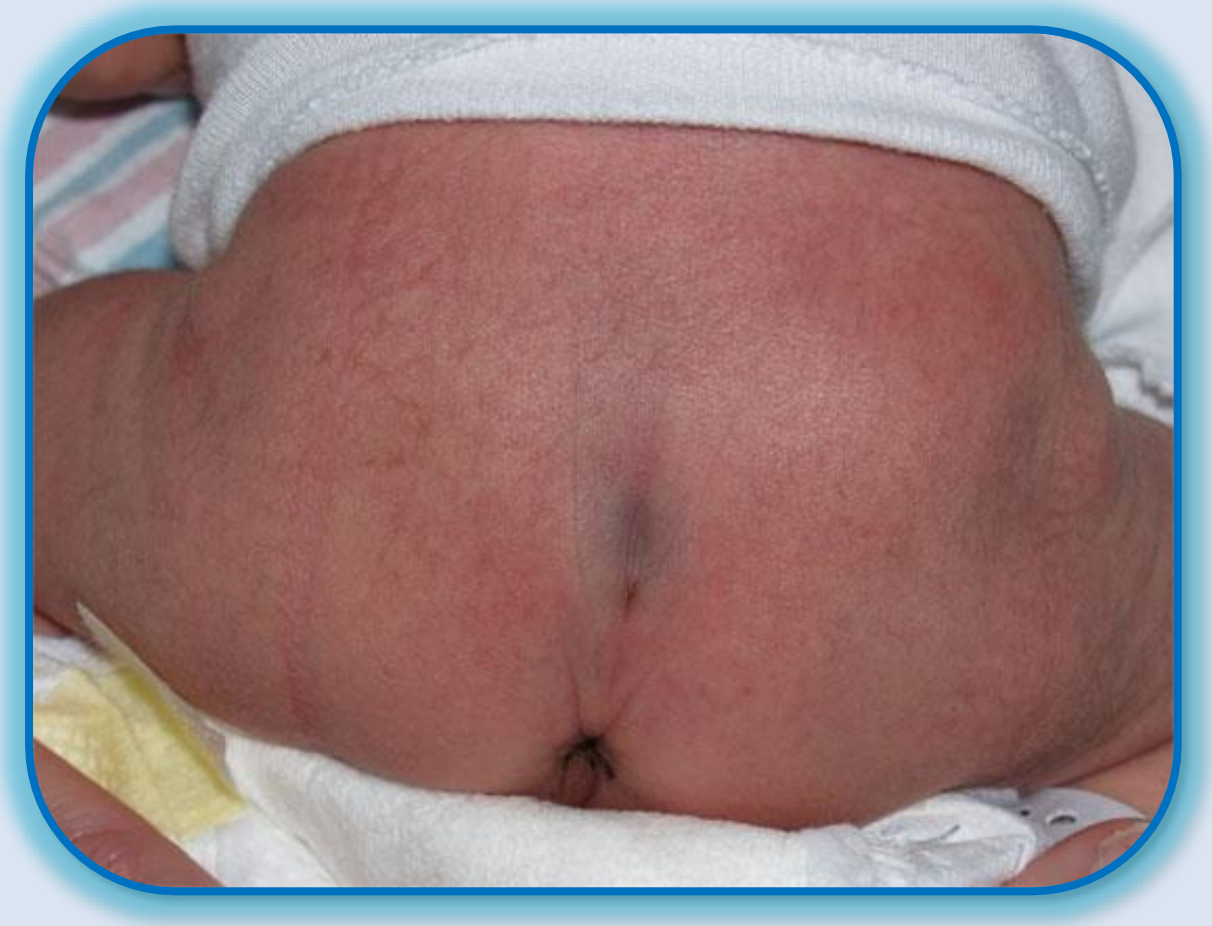
Back

Sacral Hair



Many newborns, especially those with increased skin pigmentation, will have an increased amount of hair over the lower back and sacrum. This appearance is entirely within **normal** limits and **is not** a marker for underlying spinal **dysraphism**.

Sacral Dimple

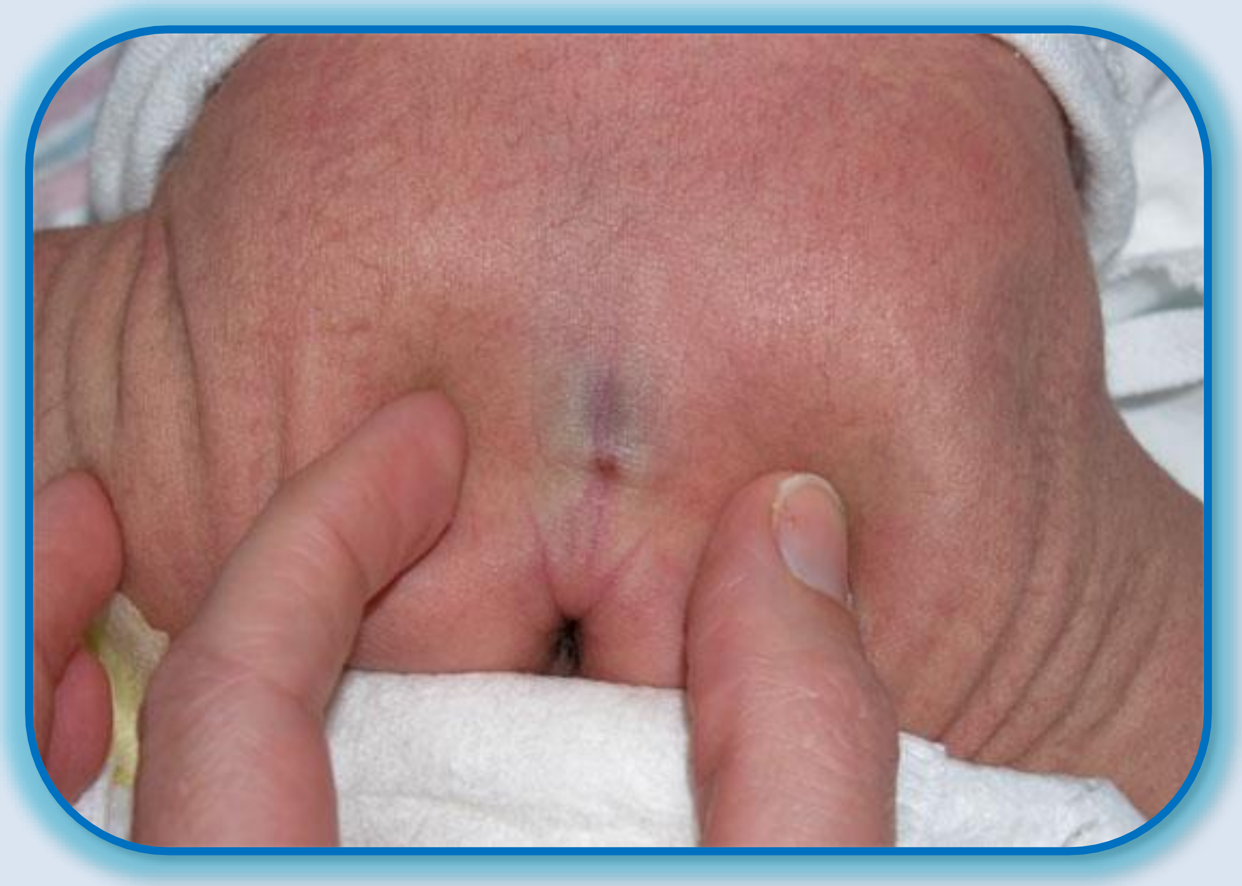


Sacral dimples are a common finding on physical exam. Most of these dimples are **"simple dimples"** and require **no** further evaluation.

A simple dimple is one that is located within **2.5 cm of the anus**, has a **base that can be visualized** and is **not associated with** other abnormalities on exam.

The dimple in this photo is the tiny dark brown shadow below the slate grey patch at the superior end of the gluteal crease.

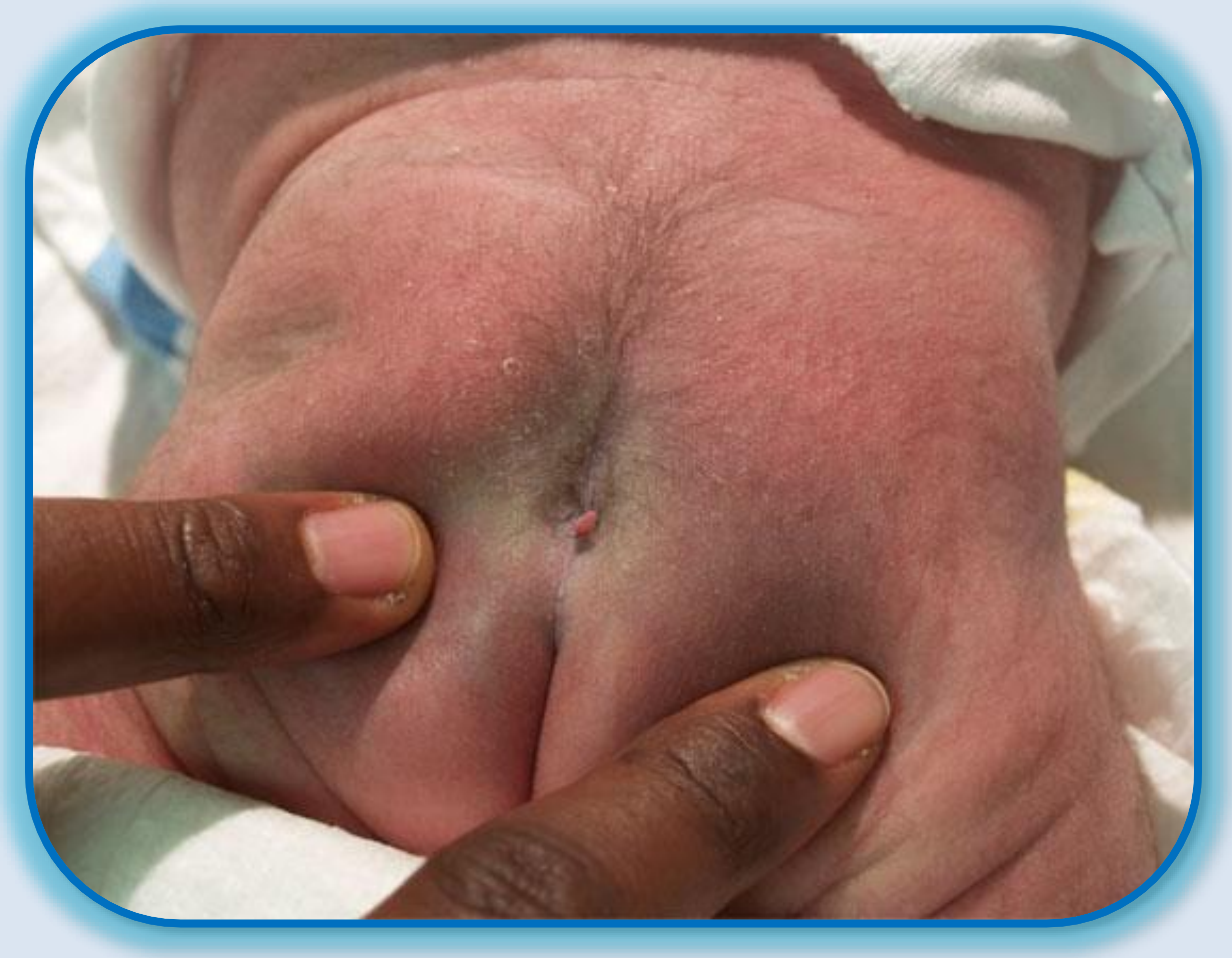
Sacral Dimple



Here the skin lateral to the dimple is stretched, skin can be seen covering the entire dimpled area. **If** the base could not be seen, this would be called a coccygeal pit.

Although fistulas above the gluteal cleft may be associated with spinal dysraphism, **coccygeal pits are benign** and do not need imaging.

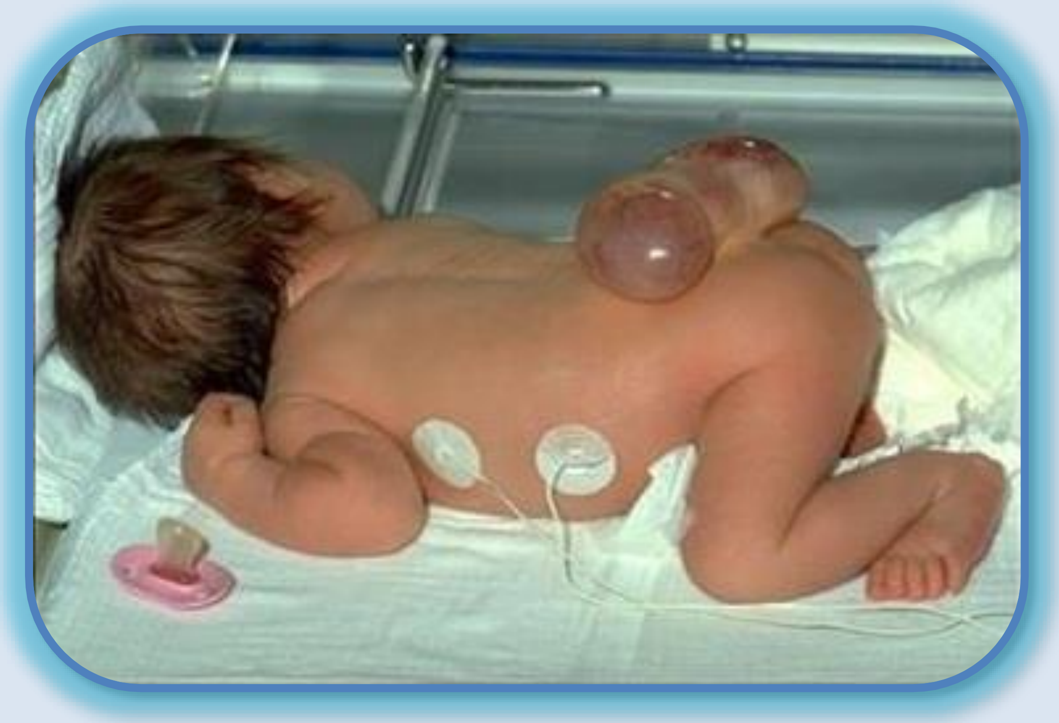
Sacral Skin Tag



Skin tags in the sacral area are also **potential indicators of spinal dysraphism**. In some cases, the "tag" may be a residual tail.

This skin tag was quite small and appeared to be very superficial, but **spinal ultrasound** was done as a screening measure. In this case, the ultrasound was normal and no further testing was needed.

Meningomyelocele

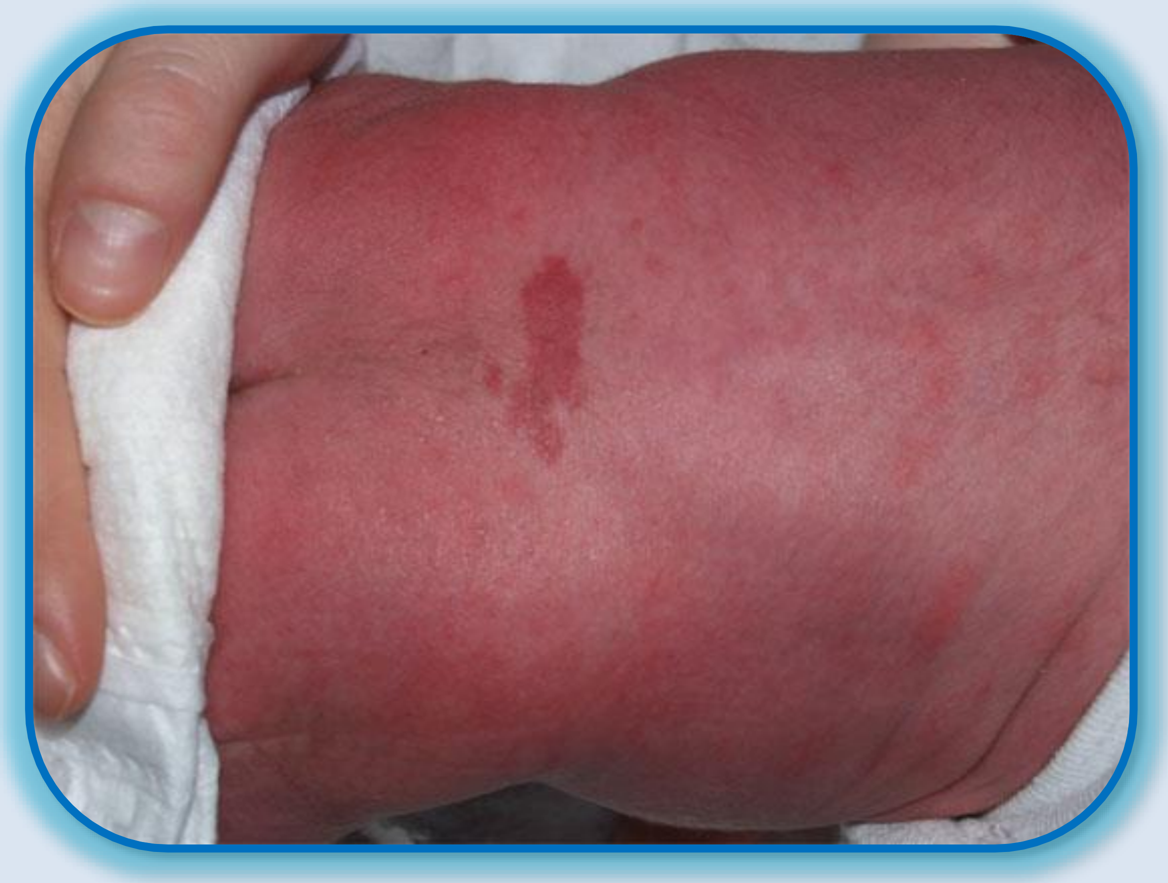


It is a type of neural tube defect that results from incomplete closure of the posterior spine during early development. The **lumbar spine is the most common** location for this abnormality. When this diagnosis is made prenatally, **caesarian section is usually recommended**, and the birth is planned at a location where a pediatric neurosurgeon and level 3 NICU are available.

At delivery, the defect should be protected with sterile saline-soaked gauze, covered by plastic wrap, and the infant kept in a **side-lying** or prone position.

Infants with this condition frequently have **associated abnormalities**; **Arnold Chiari malformation**, dislocated hips, bowel or bladder dysfunction, and lower extremity weakness are all common co-morbidities.

Butterfly Mark

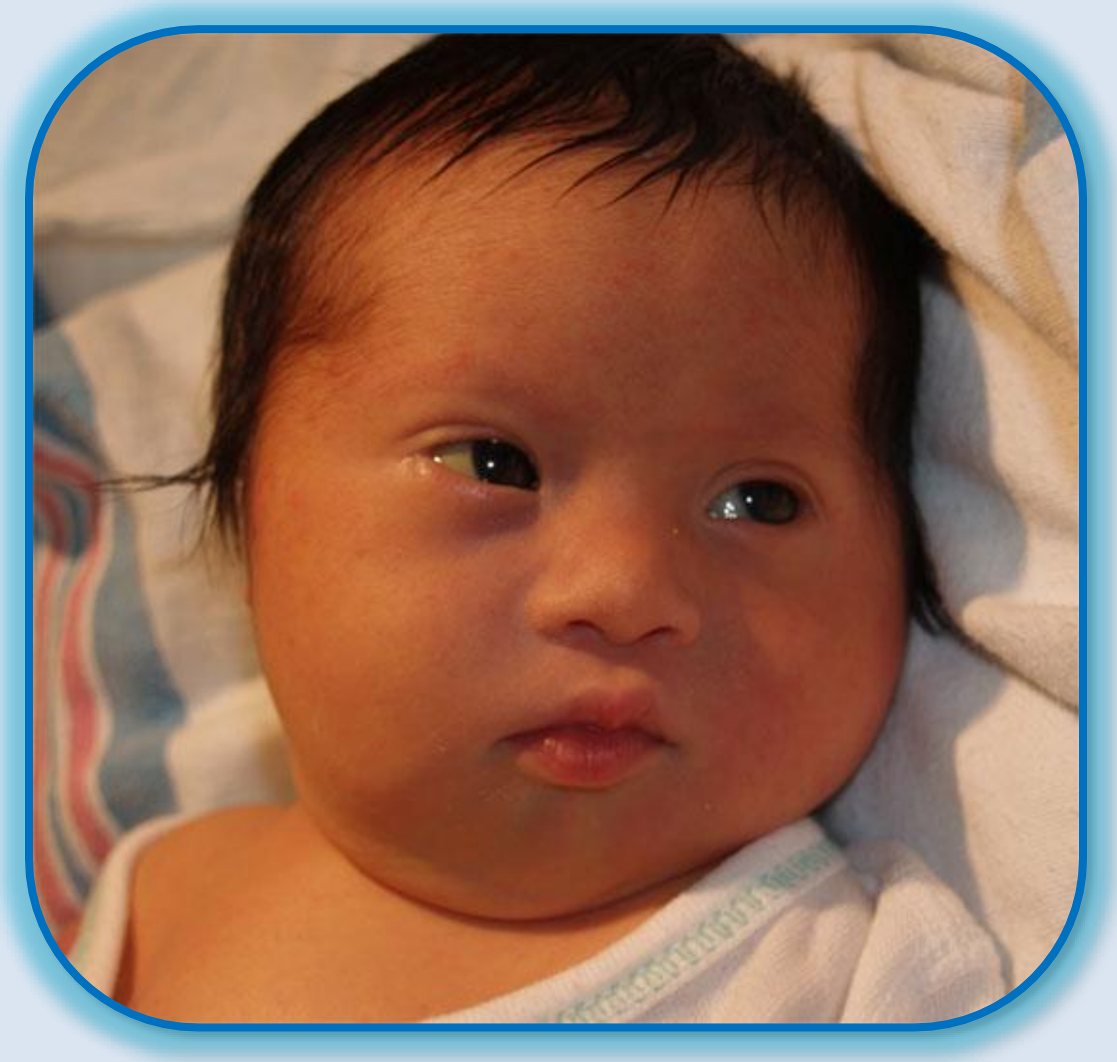


Congenital midline vascular lesions usually raise questions about occult spinal dysraphism, but so far the literature is inconclusive. Some authors suggest isolated midline port wine stains and medial **telangiectatic vascular nevi** ("butterfly marks") are benign and do not require further evaluation. Occult **dysraphism** is much more likely if **two markers** are present.

As an isolated finding, the need for evaluation is debatable.

Dysmorphology

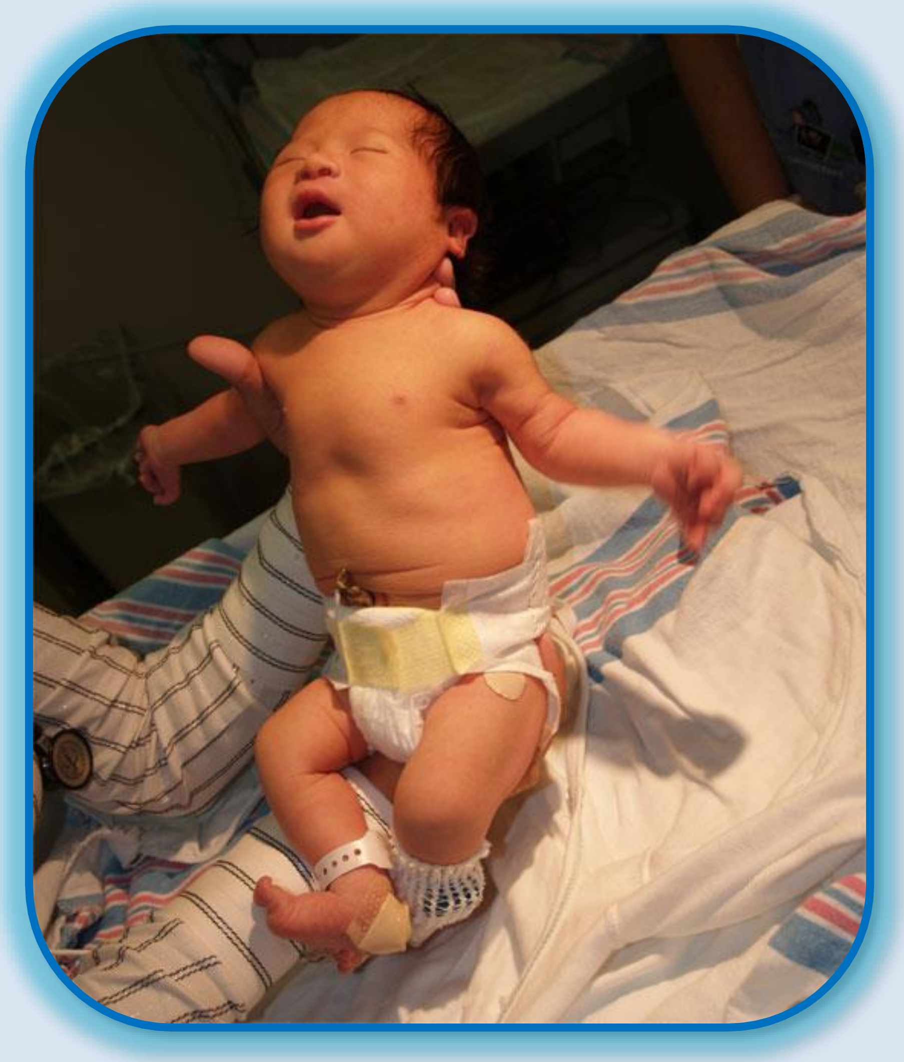
Down's Syndrome



Down's syndrome is clearly the **most common and recognizable genetic syndrome** known, although at times the physical features may be difficult to identify in a newborn.

This infant has typical facial features of Down's syndrome: up slanting palpebral fissures, a suggestion of epicanthic folds, and a flat nasal bridge.

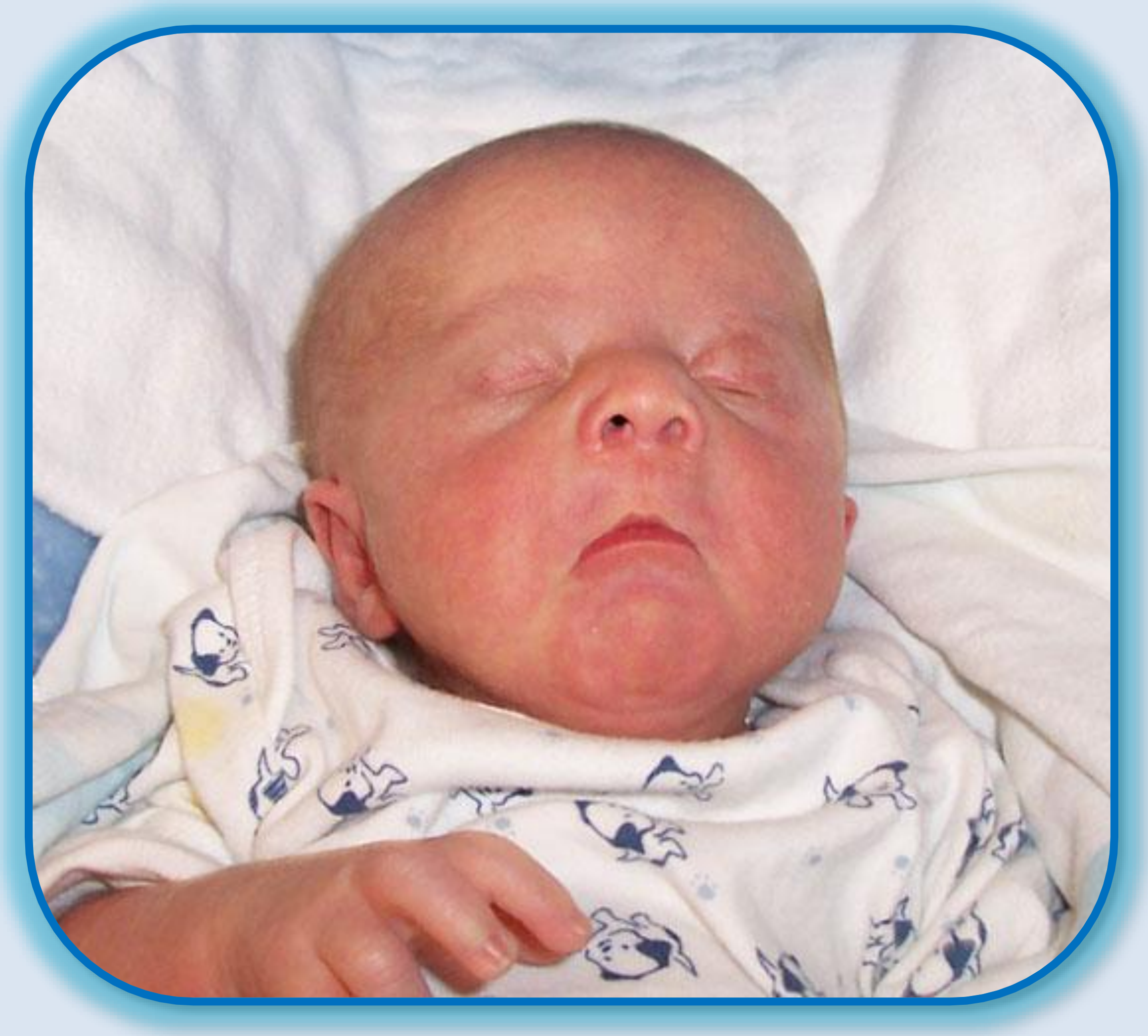
Down's Syndrome



The other striking physical finding in this newborn was **hypotonia**. When this infant was lifted off the bed, the examiner had to give much more than the typical amount of support to the infants' head and shoulders, and still the arms flop back towards the bed.

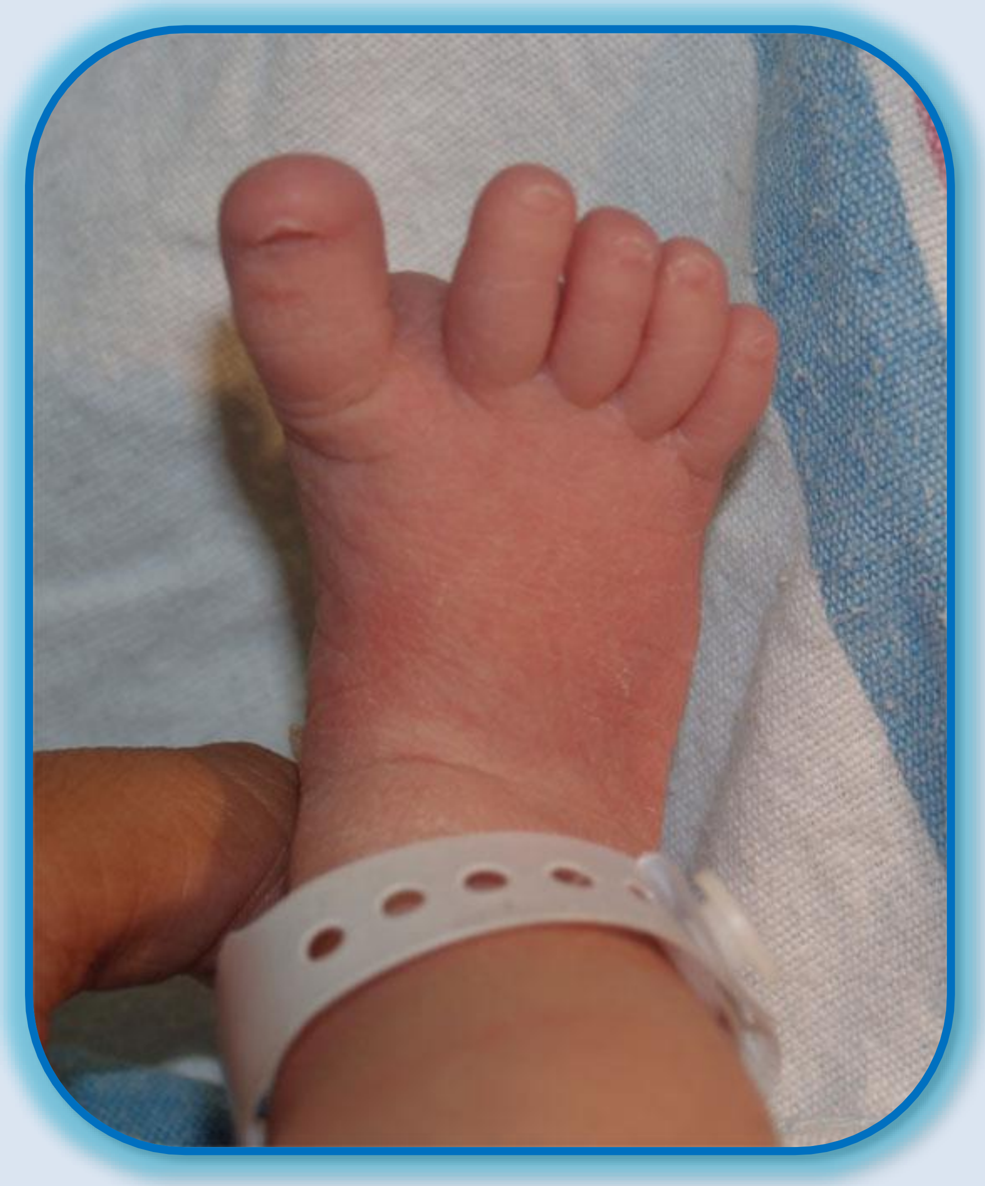
For a newborn, hypotonia of this degree can significantly impact the baby's ability to feed well, so breastfeeding should be carefully monitored.

Down's Syndrome



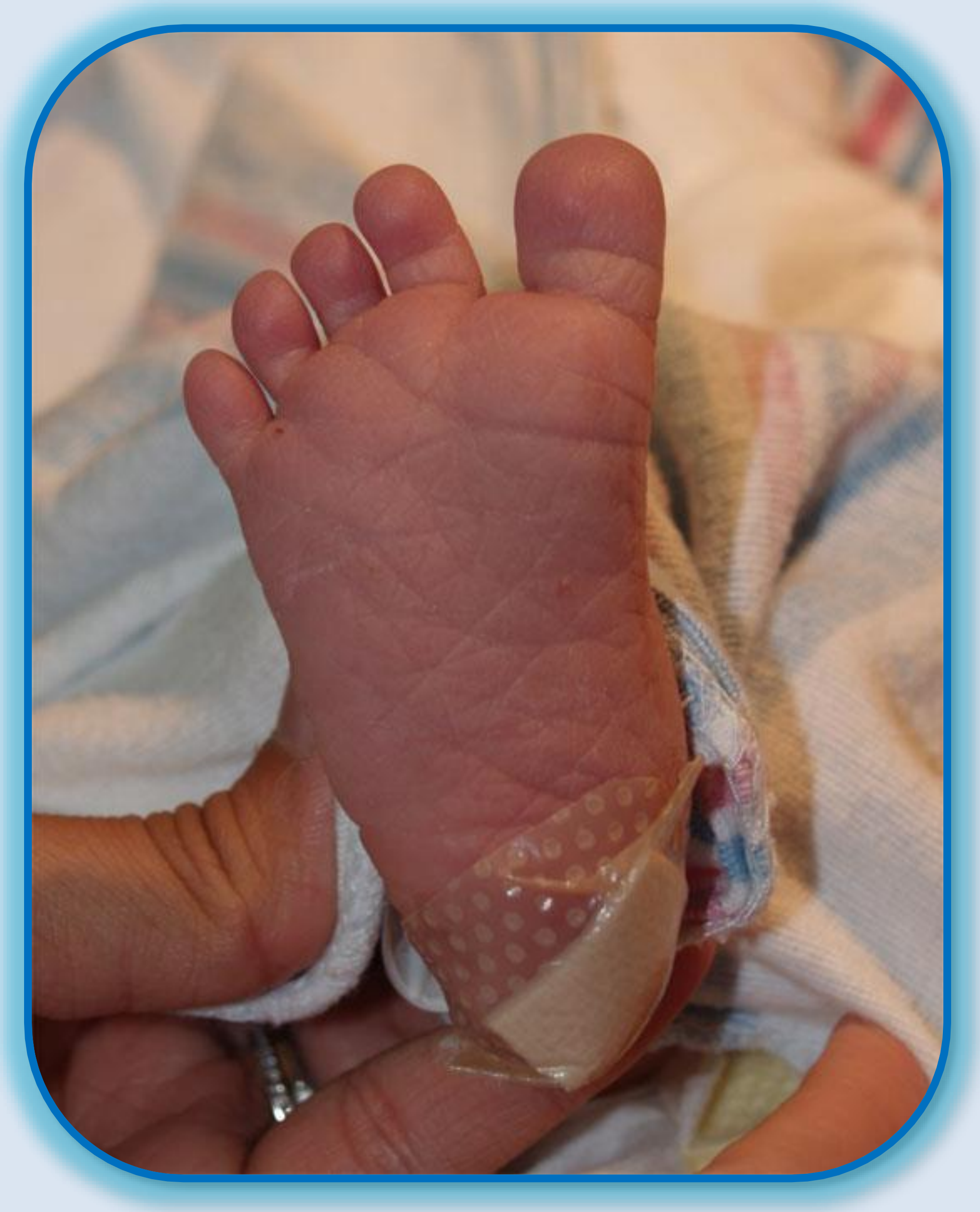
In contrast, this preterm newborn does not exhibit typical facial features of Down's syndrome. In this case, the diagnosis was made after **duodenal atresia** was detected. Because trisomy 21 affects all the cells in the body, it is reasonable to screen every baby with Down's syndrome with cardiac echo (**heart defects are noted in 50%**), and with a complete blood count (as **congenital leukemia** can occur).

Sandal Gap Deformity



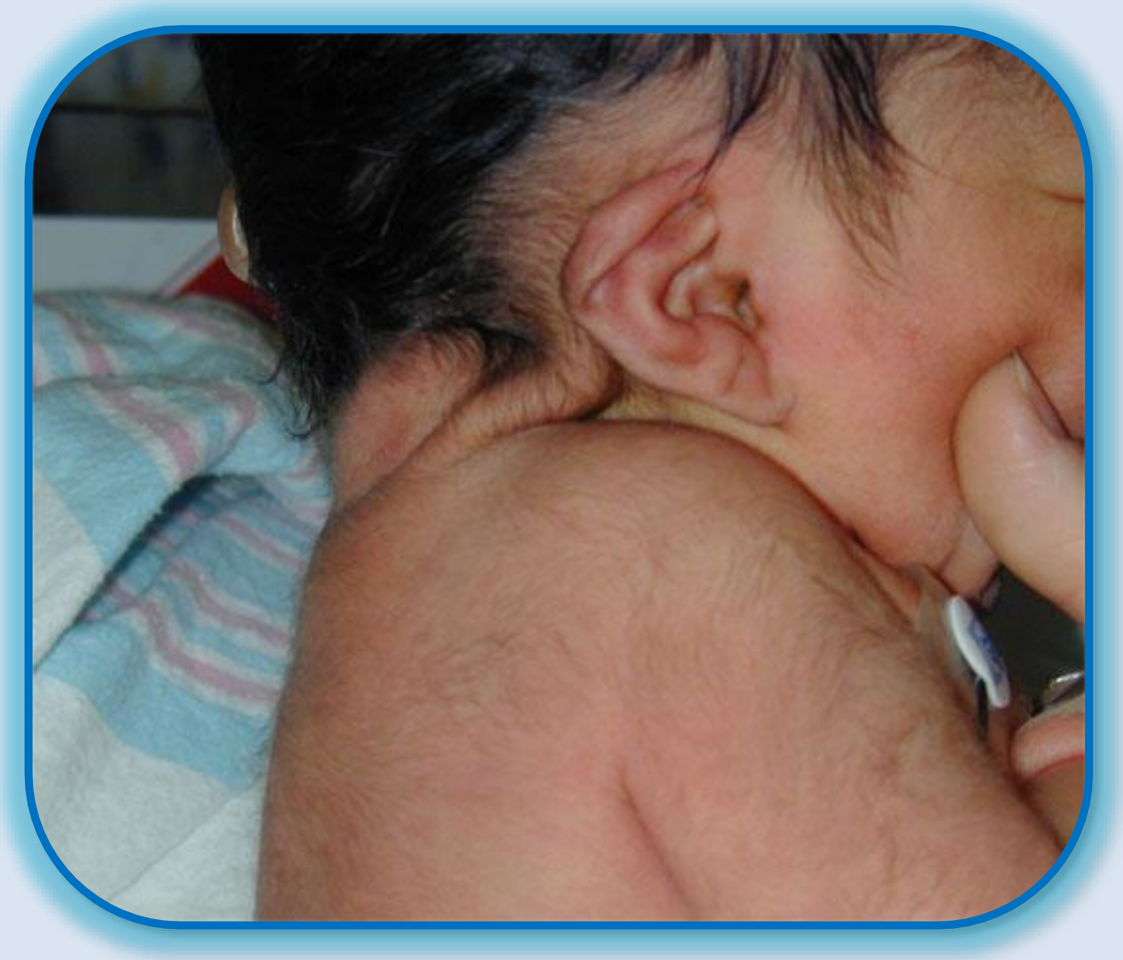
Another physical finding in many infants with Down's syndrome is an increased gap between the great and first toes. While this finding **can occur as a familial trait**, when it occurs in constellation with other features of Down's, it supports the diagnosis.

Sandal Gap Deformity



Viewed from the plantar surface, the gap between the toes is even more noticeable.

Loose Nuchal Skin

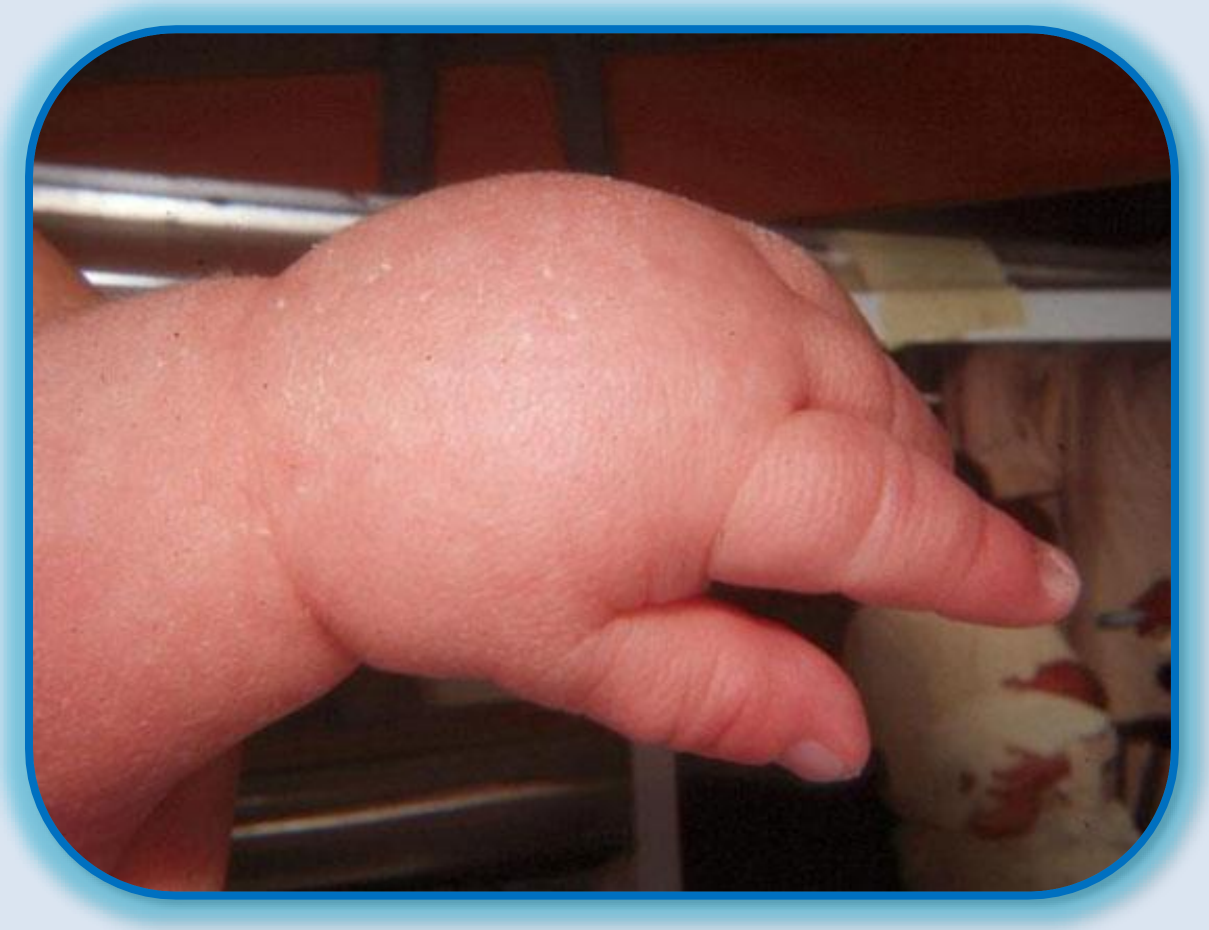


Abnormal skin folds over the back of the neck can be a marker for genetic abnormality. **Increased nuchal thickness** can be seen on **prenatal ultrasound** in some infants with **Down's syndrome**, and **increased nuchal lucency** (may be related to **lymphedema**) has been noted in fetuses with **Turner's syndrome**.

In the photo above, the skin over the back of the neck appears loose and floppy. **Webbing** may also be present, but it is hard to appreciate from this angle.

This infant was subsequently diagnosed with Turner's syndrome.

Edema of the Hand

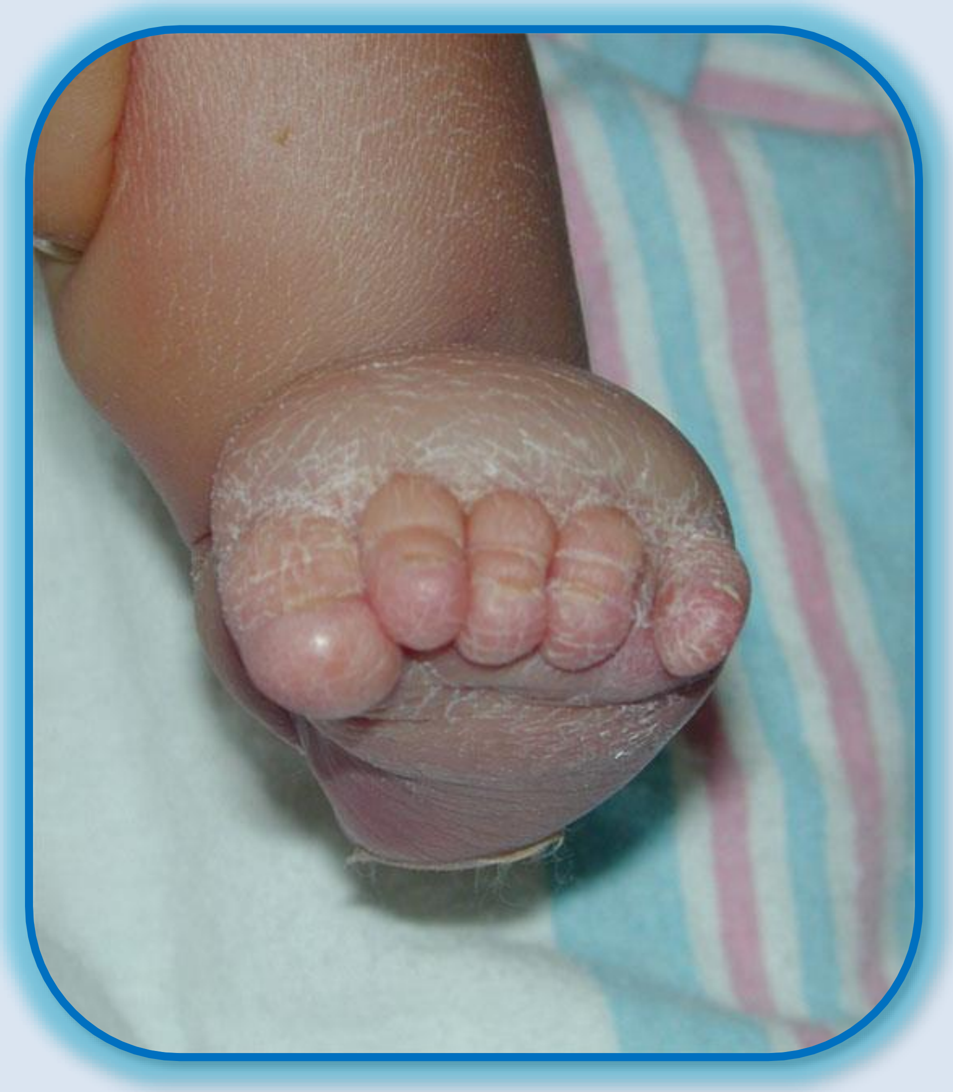


Congenital lymphedema is a frequent finding in those patients who are subsequently diagnosed with **Turner's syndrome**.

Although not all edema is related to Turner's syndrome, the diagnosis should be considered in infants who have this finding.

Other physical findings associated with this disorder include short stature, short fourth metacarpal, webbed neck, high palate and nail dysplasia. In the photo above, the **edema of the hand** is striking & Turner's syndrome was the underlying diagnosis.

Edema of the Feet



Here is an example of **lymphedema** of the feet as a result of **Turner's syndrome**. From this angle, the excessive puffiness behind the toes can be easily seen.

Chromosomal testing confirmed the clinical diagnosis.